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THE

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ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding that they are contributed exclusively to THE LARYNGOSCOPE.)

RELATION OF THE MAXILLARY SINUS TO OCULAR DISEASES.*

DR. J. IVIMEY DOWLING, Albany, New York.

The obscure etiology of many eye diseases has led to the study of the accessory nasal sinuses for the purpose of determining their possibilities as primary foci of infection.

It is now accepted as fact that the accessory nasal sinuses may be the actual primary cause of much ocular pathology, but the individualization of these cavities still remains to be determined.

The purpose of this paper is to emphasize importance of the maxillary sinus in relation to diseases of the eye.

For a ready and full comprehension of the possibilities latent within the sinuses it is well to remember that authorities differ somewhat as to the development of some of these cavities.

That both the *maxillary sinuses* and *ethmoid cells* are fairly well developed at birth is shown by the researches of Warren B. Davis in particular. The consensus of opinion concerning the *frontal sinuses* seems to be that from a surgical standpoint they may be largely disregarded during infancy; however, Killian has recorded a case of a diseased frontal sinus opened in a child one year and three months of age.

The *sphenoid sinuses,* according to many investigators, attain but small size before the third year, and even at that age Zuckerkandel states that this cavity is only the size of a pea. Merkel states that the first appearance of the sphenoidal cavity is at about the seventh year. Surgically, however, this cavity is little considered until the early adult years or later.

*Read before Eastern New York Eye, Ear, Nose and Throat Association, March 5, 1922.

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The *ethmoid cells* are of positive size even at birth and it is the likely complication of these cells that may render some operations for adenoids and tonsils of dubious benefit in the early years of life.

The *maxillary sinus,* which is the one to be considered at this time, is important in childhood because of the possibility of retention of catarrhal or purulent products occasioning secondary irritation of the eyes. Particularly during the period of dentition it must be considered as a possible complication because of the likely irritation to the dental nerves as they pass through the cavity and clinically it seems to the writer that in many ocular affections until after the second dentition that residual infection of the maxillary sinus may be more at fault than the faulty eruption of the teeth.

At any rate in several unusually persistent cases of ulcers of the cornea a rapid cure has been effected after directing treatment to the nasal complication. It is now the custom of the writer to always give attention to the nose in the phlyctenular variety of ulceration as seen in children.

The argument that the tonsils and adenoids may be the chief complication in this affection must be considered but even after their removal phlyctenular ulcerations are prone to persist and in this type of case the writer has observed a purulent discharge over the inferior turbinated body, the nature of which is such that it is removed with difficulty and may necessitate a paracentesis of the maxillary cavity. In performing this operation in a child it must be remembered that the cavity is of small size and that the exploratory puncture must be made above the inferior turbinate and not beneath it as in the adult. It is also necessary in the child to use a small trocar while in the adult the largest caliber trocar that can be employed seems to give the best results as the opening is prone to close rapidly and therefore the largest possible opening at time of operation is better.

This slight reference to the possibilities in childhood is sufficient to place one on guard and emphasize the possibilities often overlooked in the young child.

It is in the adult, however, that we have occasion to consider the maxillary sinus more often and it is in this class of patients that the most brilliant results are obtained from small, operations for draining these cavities.

As to the symptoms induced by the several cavities it is well to review them and have them in mind for even an X-ray most skillfully taken does not always indicate the actual condition existing within the accessory nasal sinuses and so it is well to recollect the

very fine teachings of Grunwald who made a most detailed report concerning the clinical manifestations of these sinuses. I know of no one to whom we are more indebted than to him for the wonderful and careful reports concerning nasal suppurations and also for his description of cases and methods of examination.

Grunwald states that "power of recognizing deep seated disease in the nasal cavities will have to become more general even with the specialists before we shall be able to show our colleagues any large number of convincing successes", and he also states that "One must never forget that there are more causes capable of producing certain symptoms than the cause which happens to be most evident", and so it is necessary that we avail ourselves of every known method to determine the actual sinus complications before instituting radical procedures.

It seems to the writer that a good method is to first consider the patient's statements, that is whether the condition of the eye is aggravated by use of the eyes and whether the ocular symptoms are better after a night's rest or if the eye symptoms and erratic pain through the head are first noticeable in the early morning and improve during the day after the patient has exercised.

Symptoms that are aggravated by use of the eyes naturally suggest that the chief factor in the case may be the eyes themselves. That being the case correction of errors of refraction should relieve them and often times does.

However, there is a certain group of ocular symptoms which are aggravated by the use of the eyes and which are absolutely occasioned by the fault within the frontal sinus or anterior ethmoid cells. This particular class of case has been recorded by Sluder who has emphasized the importance of Ewing's sign which is a tenderness of the upper inner angle of the orbit at the point of attachment of the pulley of the superior oblique and internal and posterior to it. He suggests that this is sometimes the only indication of nasal trouble, the rhinologist's findings being negative.

Patients presenting this symptom may have a sensation of sand in the eyes and may refer the pain to behind the eyes. Sluder stated that after eighteen years of observation of these cases he believes Ewing's sign to be trustworthy and almost constant and some times it is the only suggestive symptom in cases of accommodative asthenopia.

This sign is positive in cases in which the sinus is inflamed and a partial vacuum established because of interference of drainage by way of infundibulum.

In referring to this particular symptom the writer does so because in his experience diseases of the maxillary sinus may be the primary cause of the frontal sinus complication and therefore for the relief of the accommodative asthenopia treatment must be directed to the maxillary sinuses rather than to the parts above.

A casual observation of the patient suffering with frontal sinus empyema or obstruction to the drainage of the frontal sinus or anterior ethmoid cells will often times reveal congestion of the upper half of the scleral conjunctiva and also there may be considerable edema of the upper lid. On the contrary when the maxillary sinus is chiefly at fault whether because of negative air pressure or because of an actual empyema there will be involvement of the lower half of scleral conjunctiva and possible edema of the lower lid and likewise edema beneath the eyes. These external evidences of sinus complication serve to suggest involvement of the frontal sinus and anterior ethmoid cells as against disease of the maxillary sinus.

Unilateral prominence of the eye or actual exophthalmos may be due to an orbital abscess with its primary source either the frontal sinus, ethmoid cells, or maxillary sinus and intra-nasal surgery for the relief of this condition is far better than the ordinary procedure sometimes advocated.

Pain which is exhibited in the early morning, passing off later and is over the eyes suggests frontal sinus disease. That which persists between the eyes is suggestive of ethmoid disease. Pain which originates from disease within the sphenoid cavities is often occipital in nature. Another symptom of sphenoid disease which I have observed on two occasions is a succusion wave noted by patients when they throw their head forward suddenly and associated with a sensation as though the brain fell forward with a slap.

Meckel's ganglion being located at the outer nasal wall posterior to the extremity of the middle turbinate may be influenced by disease of any of the accessory nasal sinuses and will occasion the symptoms that Sluder designates as a "Nasal Ganglion Neurosis". This type of case the writer has relieved many times through operations upon the maxillary sinus.

A final consideration of the maxillary sinus resolves itself to determining whether there is present an accumulation of fluid or whether a state of negative air pressure exists. Either of these conditions may complicate ocular disease and be a primary cause of the same.

In 1907 the writer reported a case of Mrs. LeRoy M., age 49, who for six years had been under treatment for phlyctenular conjunctiv-

itis. Local treatment and change of glasses by various physicians failed to secure relief. In November, 1906 both eyes were affected and the cornea of each eye nearly encircled with phlyctenules. Maxillary empyema was present on both sides. Under local anesthesia the anterior tips of the middle turbinates were amputated and openings established through the lateral walls into each cavity. Within forty-eight hours the ulcerations and phlyctenules had disappeared with relief to the ocular distress. Patient was under observation for a long period subsequently with no recurrence.

Other cases of phlyctenular conjunctivitis have been treated with like success from time to time during subsequent years, but a citation of two recent cases will suffice to emphasize the importance of investigating the maxillary sinus in this variety of affections.

Mary E. B., age 34, entered the hospital Sept. 27, 1920. She stated that since the spring before the eyes had been sore at times, but during the past two weeks the right eye had been very greatly inflamed and she had suffered much pain and photophobia. The right eye showed serpigenous ulcer of the cornea with phlyctenular ulcers at the margin. Left eye was negative. In this case transillumination revealed the maxillary sinus to be fairly bright and the patient was suffering because of hyperplastic sinusitis complicated by like condition of the ethmoids. Under local anesthesia double maxillary paracentesis was performed. The mucous membrane lining of the cavity was very atrophic and in places the bone seemingly denuded. Patient left the hospital the next day and was cured within ten days. Wassermann was negative. X-rays were not made as reliance was placed upon the symptoms and clinical observations.

Third case, Dr. D., age 40 who had suffered for several months from phlyctenular ulcerations and for one week the left eye was inflamed and very painful. Examination showed numerous small phlyctenular ulcerations about the inner margin of the cornea of the left eye. The right eye was negative. Transillumination showed the sinuses to be clouded. Maxillary paracentesis was performed and within six days the ulcerations and symptoms referable to the eye were overcome. Atropin and dionin were employed locally because of the sluggish character of the pupil. After the paracentesis was performed there was no recurrence of pain. No X-rays were made in this case as the symptoms were sufficiently pronounced to warrant treatment without.

In these three cases although the area about Meckel's ganglion was involved relief to the neuralgic symptoms was attained only after attending to the complicating maxillary sinus disease. There-

fore it is fair to assume the primary cause of all symptoms had existed in these cavities.

Subsequent to the operations upon the antrum relief of the nasal and sinus complications were speedily overcome and the eyes restored to a normal state.

The next case, is one of erratic refraction largely influenced by maxillary sinus disease.

Max E. C., age 28, had always been near sighted and had worn glasses for the correction of myopic astigmatism. He complained of typical asthenopic symptoms and also presented Ewing's Sign.

The vision O. D. 20/70—3.25 Dcyl axis 180=20/15.

O. S. 20/70—.25 Ds—2.50 Dcyl axis 180=20/15.

The fundi were negative except for a marked parallactic motion of the central vessels.

The nose exhibited a deflected septum and trans-illumination showed the sinuses to be dark. X-ray showed the sinuses clouded. The chief factor seemed to be maxillary sinus and so on July 21, 1921, a maxillary paracentesis was performed. The mucous membrane was very boggy and hypertrophic below and atrophic above.

Ten days later the vision had improved to

Vision O. D. 20/40—1.50 Dc Axis 180=20/15.

O. S. 20/40—1.50 Dc Axis 180—20/15.

No mydriatics were used in this case and no local treatment to the eyes instituted. The simple procedure upon the maxillary sinus relieved this state of refraction.

The improvement in the vision has been sustained.

The next patient, Miss D. H., age 17, exhibited the condition of negative air pressure as the cause of frequent headaches during the past two years, both occipital and frontal. She complained of waking up in the morning with a severe headache which would last the greater part of the day. The eyes would feel sore and she was very nervous. She had had several changes of glasses by various oculists without relief. Transillumination showed the sinuses clouded and X-rays merely corroborated the findings. Ewing's Sign was present. On October 17, 1921 a simple maxillary paracentesis was performed and the inferior turbinates were infracted. The mucous membrane lining the sinuses was hypertrophic and boggy below and atrophic above.

Subsequent local treatment of the sinuses relieved all of the intranasal condition and the headaches disappeared. Glasses were then prescribed and worn with comfort.

Relief in this instance was positive and after the operation upon the maxillary sinus Ewing's Sign disappeared and the benefit was

sustained for a period of eight months. She is now under treatment again and will probably have to have a maxillary paracentesis performed again for the reason that any opening into the maxillary sinus is prone to close and oftentimes the simple operation has to be repeated or even a more radical measure resorted to.

Final case is interesting because of the retinal detachment of the right eye and very definite retinal edema of the left eye. In this case, Mr. J. B., age 49, there was a chronic hypertrophic rhinosinusitis. Operation upon the maxillary sinus and double middle turbinectomies afforded prompt relief and the condition of the left eye is now normal. The right eye has total detachment, but in the left eye there is no evidence of trouble after a period of considerably over a year. Pronounced retinal edema of the left eye has entirely subsided. This condition always precedes retinal detachment and if seen early enough can be relieved if a focus of infection is determined in some accessory nasal cavity.

It was interesting to note that at the time of operation the pupils were two-thirds dilated with marked contraction immediately upon completion of the operation. The vision of the left eye is 20/15.

In summing up the writer believes it fair to state that the maxillary sinus is oftentimes the chief factor in promoting the chronicity of disease in any one or all of the other sinuses and *ocular complication will be relieved only after treatment directed to the relief of maxillary complication.*

With the relief of maxillary disease drainage of the anterior ethmoid cells and frontal sinus oftentimes is re-established and the disappearance of Ewing's Sign has been determined in several instances without any operative procedure directed primarily to the drainage of the anterior ethmoid cells or frontal sinus.

It is, therefore, fair to assume that the turgescence of the erectal tissues which blocks the infundibulum may be primarily caused by maxillary sinus disease in a fair proportion of cases.

It is also seen to be true that disease affecting the face of the eye ball is more apt to be secondary to disease of maxillary sinus than is any other ocular manifestation. Therefore in persistent disease of these tissues the maxillary sinuses should be investigated, even in the case of negative findings.

Cryer has emphasized the relation of dental nerves to the cavities of the maxillary sinus and so it might be finally stated that if the extraction of a diseased tooth fails to relieve the ocular affection supposed to be secondary to alveolar abscess, the next procedure should be exploratory maxillary paracentesis.

116 Washington Avenue.

NASAL ACCESSORY SINUS INFECTION AND ORBITAL DISEASE.

Dr. C. G. Crane, Brooklyn, N. Y.

The ethmoidal and sphenoidal cells or sinuses cause orbital disease owing to their anatomical relation with the orbital contents and the optic nerve. We do not distinguish between anterior and posterior ethmoidal cells and the sphenoidal, as their relationship is so intimate that they form in reality a continuous group of cells. While we may have orbital disease secondary to infection in any of the sinuses through the blood stream, just as it may result from infection in the tonsils or teeth or elsewhere, it is a much less frequent clinical picture. There are undoubtedly some cases in which we have more than a single source of infection. We may have a number of eye inflammations resulting from one or more of these sources, such as keratitis, iritis, choroiditis, retinitis and myositis. Orbital celluitis is of course a direct extension of infection from the ethmoidal area. The group of cases however which we wish to discuss are those in which the ethmoidal and sphenoidal group of sinuses are the direct cause of the eye pathology. Anatomically there is every reason why an infection in this region should cause optic nerve disease. Infection in this group of cells comes under the daily observation of the specialist. Two years ago in a paper on this subject, in which I reported some cases, I stated that optic nerve disease secondary to sinus infection was seen but rarely. Since that time the number of cases seen have become increasingly more frequent. It is not that the pathology has changed, but we are becoming more alive to the possibilities in these cases. It is well that this should be so, as it is difficult to imagine anything more urgent than a prompt diagnosis in these cases. I am constantly seeing new cases of acute and chronic sinus infection, but practically none of the cases present serious eye symptoms. These cases are referred by the opthalmologist for investigation of their sinuses. It is evident that any sinus case with eye symptoms naturally seeks the opthalmologist. Any eye disturbance is immediately evident to the patient. In many of these cases the patient is not aware of any sinus disease. It is the opthalmologist that first sees these cases and recognizes the possibility of sinus infection, who is responsible for saving these eyes.

When one considers the intimate relationship of these parts, it is quite obvious that we have here an entity that will be less rare as

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our observations become more acute. The bony partition separating the ethmoidal and sphenoidal cells from the orbit and optic nerve canal, is thin and the periosteum on either side is connected by numerous diploic veins. The periosteum in the optic canal is inseparable from the sheath of the optic nerve. In some cases there is an absence of the bony wall between the optic nerve and some of the cells of this group. The intimate circulation of these parts readily explains the ease with which direct invasion may occur. The opthalmic artery and vein and their branches, supply and drain the sinuses and the orbit. The nerve head is supplied and drained by a network of arteries and veins which form an integral part of the sinus circulation. The intra-canalicular section of the nerve is supplied by small muscular branches of the opthalmic artery and is drained by the vein of Vossius, which in turn drains into the cavernous sinus. Numerous veins from the periosteum of the posterior orbit and the ethmoidal-sphenoidal group flow into the veins of Vossius. The lymphatic circulation between this sinus group and the posterior orbit and optic nerve forms a network of communication, the lymphatics actually entering the nerve substance. The direct extension of infection is certainly invited by this intimate relationship. Any inflammation sufficient to cause hyperemia without actual extension of infection may be sufficient to cause pressure within the optic canal, and consequent nerve changes. When the nerve tissue is invaded the results are more serious.

The treatment is complete exenteration of the spheno-ethmoidal cell area. It is admittedly impossible to eradicate all the ethmoidal cells in some instances, owing to the inaccessible location sometimes present. The earlier the operation the better the prognosis. The cases operated within the first few days and in which the invasion of the optic nerve is still in its early stage, have a very prompt return of vision and a gradual, but certain return of the optic nerve to normal. In the later cases the improvement in vision is much slower and the optic nerve may not return to normal. It is not unusual however even in the late cases, to have a gradual return to normal vision.

Case I. M. A., was referred to me by the opthalmologist on November 16, 1922. The history was obtained of a "cold in the head" for several days and "trouble with her eyes" for several weeks. The opthalmologist reported an optic neuritis of the left side with marked blurring of the vision. The examination of the nose showed a high deviation of the septum to the left and an acute ethmoiditis of the left side. The posterior examination showed

evidence of infection posteriorly on the left side. Conservative measures were employed for two days pending arrangements for operation. The delay in operating is not to be commended. Operation was performed on November 20th, under local anesthesia, at which time the ethmoidal cells were removed and the sphenoid opened on the left side. The usual after treatment was employed. On November 25th, the opthalmologist reported that the optic nerve was much improved, vision uncorrected, improved and corrected vision, normal. The optic nerve practically returned to normal.

Case II. M. P., referred to me by the opthalmologist on January 29, 1923. Five days ago the patient noticed pain in the left temporal region. Three days ago first noticed blurring of the vision of the left eye. Two days ago partial loss of sight was present in the left eye. Has had a discharge into the throat, but is not conscious of a "cold in the head". The ophthalmologist saw him for the first time two hours previous to his visit to my office. The opthalmologist reported no changes in the optic nerve. There was a central color scotoma present in the left eye and vision reduced to shadow even for large objects. Fingers could not be seen within six inches of the left eye. The right eye was normal. Examination showed a moderate high deviation to the left and acute swelling of the middle turbinate and ethmoidal area on the left side. No pus was in evidence. The posterior examination showed congestion of the posterior sinus area on the left side, but no pus. Under local anesthesia the patient was operated at once. The ethmoidal cells were removed and the sphenoidal sinus opened on the left side. Pus was found on opening into the ethmoidal cells. There was a profuse discharge of pus from the operated area for seven days. On the sixth day the patient stated that he noticed slight improvement in vision, but could not distinguish colors. On the eighth day he could for the first time distinguish large objects, like a chair, although not clearly. On the next day, however, he had a very marked improvement in his vision, being able to distinguish some colors and to read ordinary print. On the sixteenth day the opthalmologist reported that the vision in the left eye was as good as the vision in the right. He considered the left eye had returned to normal.

Case III. B. D., first seen January 31, 1923. For the past ten days had been under the care of the family physician for a cold in the head. The patient has shown a great desire to sleep and it has been difficult to arouse him a good part of the time. He has complained of being unable to see with the left eye and also of double

vision. The eye examination showed no change in the optic nerve, but reduced vision in the left eye. There was inco-ordination of the movements of the eye ball of the left eye, but no paralysis. The nasal examination showed complete occlusion of the left side of the nose due to a malformation of the septum resulting from an injury some years ago. Anterior and posterior discharge was present on the left side and the mucosa was very acutely inflamed. On February 2, 1923 a submucous resection of the septum was done and the left ethmoidal cells removed with opening of the sphenoid. The boy was kept in the hospital for ten days. The mental condition conntinued for a week following the operation. Observation in the office on February 13, 1923 showed a return to normal mentally and no evidence of any eye disturbance.

Case IV. I. N., referred to me April 21, 1923, with a report from the opthalmologist that he had seen her the first time on the day he referred her to me. The eye examination showed greatly reduced vision in the right eye and some reduction on the left side. The optic nerve on the right side was swollen. The patient gave a history of having had trouble with the right eye for one year, and frequently with the left eye. She had had a chronic cold in the head with difficulty in breathing and severe headaches. The headaches were incapacitating in character. Examination showed complete obstruction of the middle meatus on both sides with swollen middle turbinates. There was a profuse posterior discharge. On April 27, 1923 the double ethmoid-sphenoid operation was done under local anesthesia. Following the operation there was a great deal of swelling and discharge in the area of the operation. The headache and pain in the eyes very soon subsided and a gradual improvement in vision was reported. The last report from the opthalmologist on June 30th stated that the eye pathology was returning to normal and a good result was to be expected.

Case V. I. E., referred to me by the opthalmologist May 16, 1923 because of an acute blurring of the vision of the right eye. The examination of the opthalmologist showed central scotoma for white and irregularity of the blind spots with reduction of vision. These changes were confined to the right eye. Nasal examination showed ethmoiditis on the right side. Following a cold in the head the vision had been blurred in the right eye for one week. On May 17, 1923 the ethmoid-sphenoid operation was done under local anesthesia. No change in the vision was observed for one week, when an improvement was noticed by the patient. Examination on June 7th by the opthalmologist, showed the right eye to have returned to normal.

Case VI. Mr. D. H., referred to me by the opthalmologist on December 8, 1921, with a history of acute optic nerve neuritis and acute retinitis of the right eye for the past four weeks. The left eye has been totally blind since infancy. The vision was reduced to 1/10 of normal. The patient gave a history of frequent colds in the head with profuse discharge and chronic nasal obstruction. There had been several attacks of influenza. The examination of the nose showed practically complete obstruction due primarily to a deformity of the septum. The mucous membrane of both sides was markedly swollen and an active discharge was present from both sides anteriorly and posteriorly. On December 9th a sub-mucous resection of the septum was done and the right middle turbinate removed. On December 22nd he was able to see letters ¼ inch high, distant 17 inches, which was a very decided improvement. On December 23rd he could see the same letters a distance of 24 inches. On Dec. 27th was able to read the newspaper. On January 9th, although the vision was improving, the ethmoid-sphenoid area was operated. Following this procedure the vision in the right eye returned to normal. Observations as late as June, 1923 showed the return to normal to have been permanent.

Case VII. E. M., referred to me by the opthalmologist June 23, 1923. Four months ago first noticed sudden loss of vision in right eye. The loss in vision has been constant ever since. The opthalmologist reported swelling of the disk. The tonsils and adenoid had been operated eight years ago. Examination showed marked nasal obstruction due to a deviated septum. The right middle meatus was entirely occluded and the mucous membrane was swollen. There was a profuse purulent discharge posteriorly on the right side. The tonsils were present and very much infected. There was also considerable adenoid tissue present. On June 25th under general anesthesia (the patient was 15 years old) a sub-mucous resection of the septum was done, the ethmoid-sphenoid operation was performed on the right side and the tonsils and adenoid removed. The opthalmologist reported on July 5th that vision in the right eye was improving and that the patient could read two more lines. The last report, July 15th, showed continued improvement in vision and the opthalmologist was sure of return to normal vision.

The foregoing cases have been selected from a very considerable number treated surgically with gratifying results. Some of the cases treated have presented a different picture from those selected and will be reviewed separately.

353 Washington Avenue.

PUNCTURE OF THE MAXILLARY SINUS.

DR. SIMON L. RUSKIN, New York, N. Y.

It has been the aim of Dr. Imperatori's clinic at the New York Post-Graduate Medical School and Hospital during the past year to investigate methods not only for facilitating the teaching of nose and throat but also to devise instruments that would make operating by the student safer, easier and more exact. Working along these lines, I have developed a series of new instruments which have been found useful clinically.

Puncture of the maxillary sinus has long proven its value in the diagnosis of sinusitis of the first series of sinuses. To facilitate this procedure, a needle has been constructed which is based on the anatomical condition that must be considered in puncture of the maxillary sinus. Without a thorough knowledge of the anatomy of the maxillary sinus and lateral wall of the nose, puncture of the antrum can become, as I have frequently seen, a matter of blind force instead of the delicate procedure that it should be.

The maxillary bone has a pyramidal shaped body to which are attached four processes, the frontal which reaches up to the frontal bone and goes to make up the root of the external nose, the zygomatic extending laterally to articulate with the zygoma, the palatine which forms the anterior two-thirds of the hard palate and the alveolar process for the teeth. The pyramidal body of the maxillary bone which is hollowed out by the sinus has its base facing the lateral wall of the nose and presents here a large defect, the hiatus maxillaris. This large window leading into the sinus is closed for the most part by bone and for the lesser part by membrane. The perpendicular part of the palate bone closes the posterior portion of the hiatus, the uncinate process and bulla of the ethmoid the upper, and the processus maxillaris of the inferior turbinate closes the lower portion. Plate I illustrates this schematically.

In view of the fact that the orbit is in such close relationship to the middlea meatus, we select the bony inferior meatus for puncture. The inferior meatus as can be seen from Plate I is formed by the maxillary bone around the hiatus maxillaris and the delicate wing-like processus maxillaris of the inferior turbinate that goes to close the lower portion of the hiatus maxillaris. The bone of the processus maxillaris of the inferior turbinate is practically always delicate whereas the maxillary bone around it varies in thickness and in cases where the antrum is small can reach a considerable

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thickness. This is well illustrated in Plate IV. It is thus obvious that the most desirable point for puncture is the processus maxillaris of the inferior turbinate. It is this anatomical point that has led me to devise the antrum needle so as to make the point of the needle seek out the thin processus maxillaris for puncture.

A study of the inferior turbinate (Plate III) shows it to consist of two main portions, a turbinal part that hangs free in the nose and the wing-like processus maxillaris joined to its upper edge and fitting into the hiatus maxillaris. The upper margin of the inferior

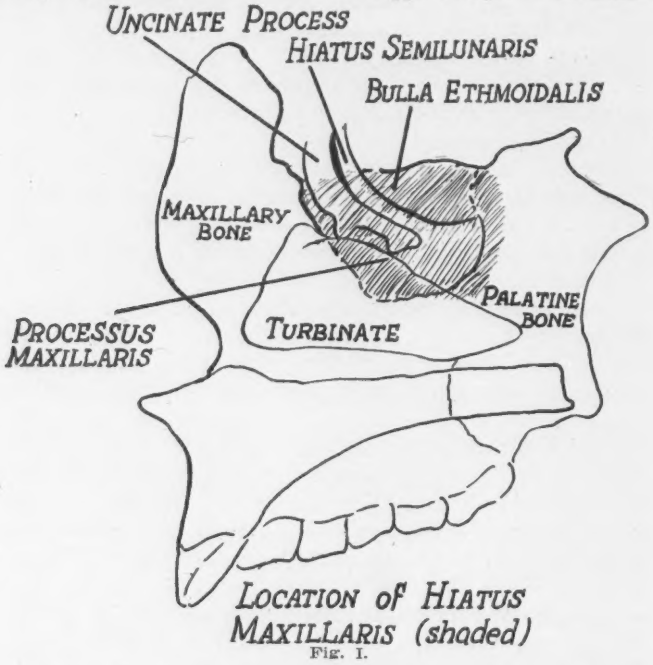

Fig. I.

turbinate along its attachment to the lateral wall slopes slightly upwards in its anterior third and then bends gently downwards as it runs posteriorly. Slightly behind the apex of the curve the processus maxillaris is reached and here at the uppermost point between the turbinate and the lateral wall is the point of choice for puncture. It will immediately become apparent that the thick needle commonly used will not, in many cases, be able to reach this point. The result is that the already bulky instrument must be forced through the thicker less favorable spot with greater shock to the patient. This is well shown in Plate IV.

Plate V shows the medial wall of the antrum with its ostium directly under the floor of the orbit. At about the center is the mark made by the needle as it passed through the processus maxillaris. It is labeled upper level of inferior meatus.

The needle presented has several features that recommend it. On the needle, at a point four cms. from the tip is a marking which indicates the average distance of the processus maxillaris from the

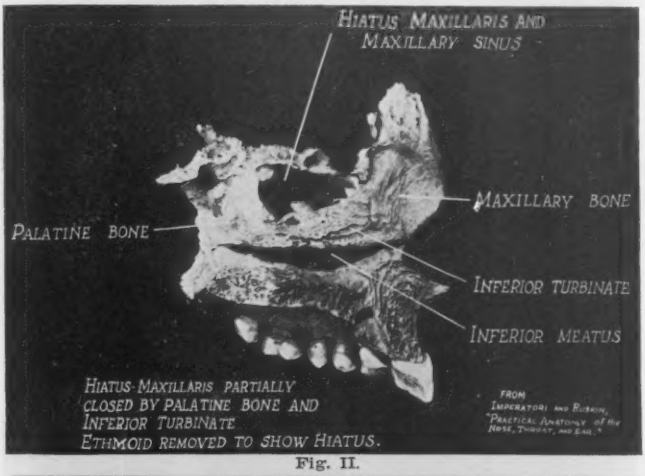
HIATUS MAXILLARIS AND MAXILLARY SINUS
MAXILLARY BONE
PALATINE BONE
INFERIOR TURBINATE
INFERIOR MEATUS
HIATUS-MAXILLARIS PARTIALLY CLOSED BY PALATINE BONE AND INFERIOR TURBINATE. ETHMOID REMOVED TO SHOW HIATUS.
FROM IMPERATORI AND RUSKIN, "PRACTICAL ANATOMY OF THE NOSE, THROAT, AND EAR."

Fig. II.

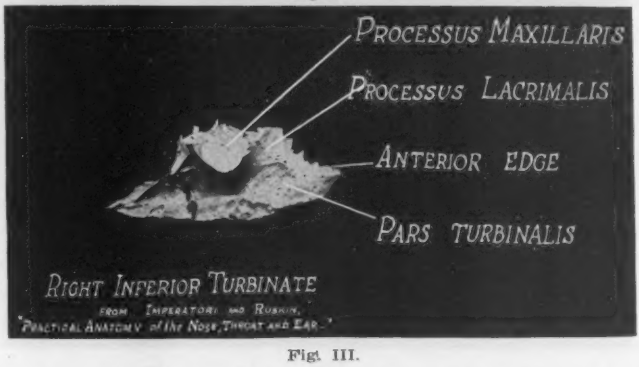

Fig. III.

anterior nasal spine so that those who are less experienced have a guide as to the depth that the needle should be inserted. It also aids in locating the same site for repeated punctures. Dr. Imperatori suggests measuring the distance between the anterior nasal spine and the free edge of the septum posteriorly and then dividing the distance into three equal parts, as a guide to the depth for the insertion of the needle. The middle third corresponds to the location

of the processus maxillaris. The upward curve at the point is such that when the needle is placed in the inferior meatus, under the turbinate, at the proper depth, the point lies in the immediate vicinity of the processus maxillaris. Simply pushing the instrument backward with a slight rotation to the lateral wall and outward, as though it were a straight needle forces it into the maxillary sinus. The

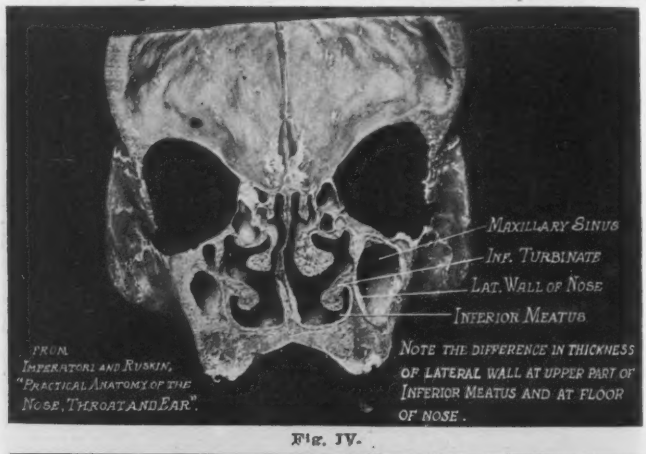
MAXILLARY SINUS
INF. TURBINATE
LAT. WALL OF NOSE
INFERIOR MEATUS
NOTE THE DIFFERENCE IN THICKNESS OF LATERAL WALL AT UPPER PART OF INFERIOR MEATUS AND AT FLOOR OF NOSE.
FROM IMPERATORI AND RUSKIN, "PRACTICAL ANATOMY OF THE NOSE, THROAT AND EAR".

Fig. IV.

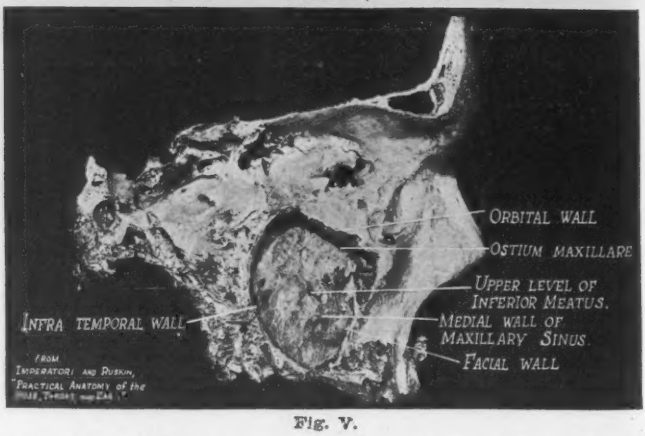
ORBITAL WALL
OSTIUM MAXILLARE
UPPER LEVEL OF INFERIOR MEATUS.
INFRA TEMPORAL WALL
MEDIAL WALL OF MAXILLARY SINUS.
FACIAL WALL
FROM IMPERATORI AND RUSKIN, "PRACTICAL ANATOMY of the NOSE, THROAT and EAR".

Fig. V.

point of the needle has a mule back tip which adds sharpness to the instrument. The handle is a modification of the late Professor Fein's needle and is quite useful in that it allows delicate and exact manipulation. It is held between the thumb and fingers as illustrated in Plate VII, the hyothenar eminence of the hand resting on the patient's maxilla. The left hand covers the right and is used for pressure while the right hand serves for counterpressure.

Thus the point of the needle is controlled at all times. The upper pole of the handle is milled so that in withdrawing the needle the milled pole is turned up to the vertical place and extracted. When the needle is in the sinus, rotating it gently will tell you whether the tip is free or caught in soft tissue. This is a great aid in avoiding the dangers resulting from injection of air or infected fluid into a dilated vein. Finally, the gauge of the needle is thin enough to make the whole procedure a gentle manipulation and still strong enough to allow of its use without fear of its breaking.

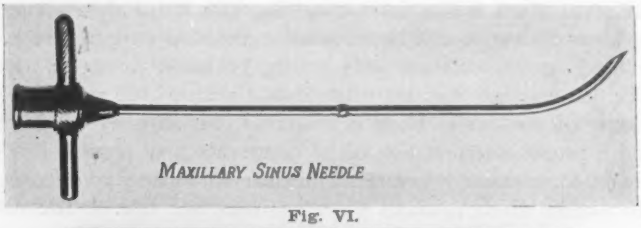

Fig. VI.

Fig. VII.

Occasionally, it will be found that the point of the needle has met too great a resistance. In those cases, the needle is generally too low, and too much anteriorly. Disengaging the point and pushing the needle further back and higher between the inferior turbinate and the lateral wall will lead you to a place where the needle will break through with ease. The needle is also threaded for the attachment of the ordinary tonsil syringe for the introduction of medication into the antrum or the aspiration of pus for bacteriological study. The instrument has had thorough clinical trial and in a series of over two hundred antrum punctures I have never had occasion to resort to the mallet.

351 West 86th Street.

EPISTAXIS LEADING TO THE DIAGNOSIS OF SCURVY AND A REVIEW OF THE SUBJECT OF EPISTAXIS.

DR. A. LOBELL, New York.

Epistaxis, as a manifestation of some obscure constitutional disease, has not been accorded the prominence in the current medical literature which it deserves. Conceding that it is only a symptom of some disease, it still deserves some attention on our part even as much as the symptoms of vomiting, headache, coma, etc. It is true that epistaxis does not often lead to a fatal issue as far as the danger of the loss of blood is concerned, but an early recognition and a proper interpretation of its occurrence may prevent loss of life in some cases. We are all familiar with many contsitutional diseases in which epistaxis plays an important role. The most complete and comprehensive monograph on the relationship between epistaxis and general medicine was written by Harold Hays[1]. He enumerated practically all the diseases that present this symptom and pointed out the significance of this phenomenon.

Epistaxis in a mild form occurs frequently in the robust and healthy individual without any ill effects. Unless the bleeding is profuse or unduly prolonged, it is customary to consider it as harmless. This so-called physiologic type of epistaxis should always be considered by the physician as an abnormality until he convinces himself to the contrary after thorough examination for a cause of the bleeding. Some people believe that an attack of epistaxis is of distinct benefit to them. That is undoubtedly true, but they overlook the primary and important consideration that there must be some abnormal underlying cause for the bleeding by which nature has afforded them relief through its manifestation. Indeed, Beverly Robinson[2], in the discussion of the treatment of epistaxis, states that epistaxis is of therapeutic value in arterio-sclerosis with high blood pressure, in chronic nephritis, in cirrhosis of the liver, etc.

Case Report: How valuable a guide this symptom can be in the solution of some obscure constitutional disturbance can be illustrated by the following case report:

Read in part before the Lebanon Hospital Alumni Association on May 13, 1923.

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Mrs. R. R., age 60. Her family history is irrelevant. The important point in her past history is, that she was operated for cholelithiasis in 1910. She was completely relieved from the billiary colic, but she still complained of gastric disturbances and had to be under the care of a gastroenterologist who prescribed for her the necessary restricted diet that agreed with her digestion.

Present Illness: In the beginning of 1921, she noticed that she was getting weaker every day. She had an occasional attack of bleeding from the nose that lasted only several minutes, alternating from one side to the other and the bleeding was easily controlled by cold application and other home remedies. Although she never had any nose bleeding during her past life that she could recall, nevertheless, she did not think that it was of any importance until the attacks became more frequent, when she consulted her family physician.

After he examined her carefully, he found that she had some edema of the legs and some tenderness in the left calf region. He also observed some prominent veins over this area and he concluded that it was a case of phlebitis and ordered her to bed for complete rest. He paid little attention to the epistaxis; at least he could not correlate its appearance with the other signs and symptoms. Several weeks passed and the woman became very pale and extremely weak. She also complained of excruciating pain in the extremities, more so in the region of the shafts of the long bones than at the articulations. At this stage of the illness, the attacks of epistaxis occurred at irregular intervals of two, three or more days and the bleeding was slightly more prolonged and the flow was more profuse than previously.

Within a short period, two consultants, men of high repute, were called in to give their opinions. One of them thought that she might have had some intraabdominal malignancy with metastasis in the bones and that would explain the severe pains in the bones, the loss of weight, the anemia, etc. However, he could not account for the cause of the persistent recurrent epistaxis. The other consultant was more thorough in his physical examination and he discovered that she was suffering from a most extensive pyorrhea of the gums, marked dental caries, a foul breath and painful mastication. His opinion was, that she was suffering from a low grade of sepsis without febrile manifestations, and that would account for the various signs and symptoms enumerated above. It seemed to him that the epistaxis could be explained on a basis of toxemia and severe anemia. He was particularly careful to rule out leukemia

He expressed himself definitely that the chances for recovery were very poor unless the infection could be abated by immediate dental care.

Accordingly, Dr. S. Terens, D. D. S., was called to see the woman for the purpose of extracting all her teeth. Fortunately, the dental surgeon happened to come in when she had an attack of epistaxis. He realized immediately that there was great danger of the patient bleeding to death in the event of performing any extractions under the circumstances. He was surprised to find that a rhinological examination was not made up to that time in order to throw some possible light on the condition.

It was through his courtesy that the writer was called to see this patient. It was June 7, 1921, when I made the first examination.

Physical Findings: The general appearance gave the impression that one was dealing with some very grave condition. She looked cachetic, the anemia was very severe. She was emaciated. She appeared in agonizing pain and one could have concluded that she was in a moribund and hopeless state. A rhinoscopic examination presented a turgescent mucous membrane of both nasal fossae. There was considerable oozing of blood from the turbinates and septal regions. A 4 per cent solution of cocain together with a few drops of adrenalin was applied to the bleeding surfaces and the bleeding stopped promptly. One could see that the mucous membrane was not smooth and even, as in a normal condition. The surface was rather granular in appearance and it bled very easily after the slightest touch with a probe. There was no evidence of any malignant or other growth within the nasal fossae. The gums presented marked swelling and the teeth were deeply buried in the gums. Blood and purulent material were bathing the margins of the gums. The surface of the gum was not smooth, but it had a fungous and follicular outline. It was extremely soft, tender and bled readily on the slightest provocation. The teeth were markedly decayed, loose, and painful. The odor was very foul. The tongue was coated. The pharynx was congested. She could barely speak on account of severe asthenia. The pupils reacted normally. The ocular muscles and fundi were normal. The temperature was 98 degrees F., the pulse 108, respiration 28. The heart sounds were faint and distant. The blood pressure systolic 78, diastolic 64. The lungs were negative. There were no palpable masses in the abdomen. There were no enlarged lymphatic glands anywhere. There was a tender induration in the left calf region diffuse in character but there was no redness over the region and no heat. The shafts of

the long bones over all the extremities were quite tender. There was no evidence of any disturbance of the cerebro-spinal system. The urinary findings were, a trace of albumen, an occasional hyaline cast, and numerous red and white blood corpuscles. It was negative for sugar, acetone and diacetic acid. A blood count revealed, red cells 3,452,000. The hemoglobin was 55 per cent. There was a leukocyte count of 12,000 with 76 per cent poly-morphonuclear, 21 per cent lymphocytes and 3 per cent eosinophyles. There was a moderate amount of poikilocytosis and anisocytosis, an apparent increase in the platelets, but there were no megaloblasts, and no myelocytes. The blood Wassermann was negative.

Diagnosis: The problem was, whether we were dealing with one primary disease that gave origin to the epistaxis, the condition of the gums and teeth, the anemia, asthenia, the induration of the calf of the left leg, the severe pain in the shafts of the bones, etc., or were there two or more independent conditions that obscured the diagnosis in this patient. A number of diseases were ruled out, such as pernicious anemia, various leukemias, on account of the negative blood findings. Whereas a malignant condition of some hidden organ with metastasis could not be ruled out without the aid of the X-Ray of the bones, still that diagnosis could not explain the epistaxis or the condition of the gums and teeth. The theory of sepsis originating in the pyorrheal pockets could not explain the absence of some rise in the temperature during such long period of illness and it could not explain the epistaxis. The writer was inclined to the idea that we were dealing with one disease and that the condition was not localized in any particular organ. It seemed that there was an abnormal state of the blood plasma. It could have been well caused by some extraneous toxic substance that the individual had absorbed into the system such as phosphorus, but fortunately there was no history of exposure to such poisonous sources. A detailed history of the exact diet that the patient lived upon for two years prior to this illness, revealed the astonishing fact that she totally abstained from all fruits and vegetables in any form, either raw, cooked or canned. She had milk, eggs, poultry, but she was particularly careful to exclude any vegetables when she boiled the meat. The idea of scurvy came promptly to the surface and it surely answered all the questions. The epistaxis was therefore the master key to the solution of this problem. Without the persistent nose bleeding to account for, the matter would have been settled as sepsis due to dental origin and the patient would probably have died after the extraction of the teeth. The therapeutic

test of the administration of anti-scorbutic food was the acid test of the correctness of the diagnosis. The rapid improvement, the prompt cessation of the bleeding was most dramatic in this patient.

COMMENTS.

This case clearly demonstrates one important point, that the sphere of the rhinologist is not limited to the narrow boundaries of the nasal fossa. In a case of nasal hemorrhage, he must not be contented with the introduction of remedial agents for the purpose of stopping the bleeding only, he must make a further step and search for the primary cause of the epistaxis to prevent its recurrence. It shows that he must possess a comprehensive knowledge of the various diseases that cause epistaxis. This case further illustrates that team work is an essential factor in the diagnosis of diseases.

Since it has been shown how valuable a guide in the diagnosis of obscure diseases the symptom of epistaxis can be, it will not be out of place to briefly review the subject of epistaxis.

Enumeration of the various causes of epistaxis.

1. Diseased conditions occurring in the nasal structures. These are as follows: Ulcerations and erosions of the septum and other areas in the nose, nasal diphtheria, adenoids, foreign bodies, syphilis, tuberculosis, rhinoscleroma, carcinoma, epithelioma, sarcoma, angioma, and all forms of trauma including fractures of the skull and all types of post-operative hemorrhages.

2. Diseases of the cardio-vascular-renal system. Arterio-sclerosis, chronic nephritis, high blood pressure caused by any abnormality in the system; venous stasis, as in cirrhosis of the liver, caisson disease, cavernous sinus thrombosis, pertussis, ascension to very high altitudes, etc.

3. Diseases of the blood cells, blood plasma and blood forming organs.

These are: changes in the red cells, as in primary and severe secondary anemia, erythro-cytosis with or without splenic enlargement, lymphatic and spleno-myelogenous leukemia, hemophilia, purpura hemorrhagica, and scurvy.

4. Some of the diseases of bacterial origin. Typhoid, cerebro-spinal meningitis, diphtheria (not of nasal origin, but due to toxemia), measles, scarlet fever, pertussis, erysipelas, small-pox, pneumonia, malaria, septicemia, pyemia, etc.

5. The absorption of poisonous substances into the system. Among these may be enumerated, acute and chronic phosphorus

and mercurial poisoning, ergot, and certain types of auto-intoxication.

Etiology: Epistaxis occurs frequently in the different races and sexes. In infancy it frequently accompanies hemorrhages from other parts as in various types of hemophilia. According to Holt[3], it is caused by syphilis in the new born. In childhood it is most frequently a concomitant of adenoids, diphtheria, and the presence of a foreign body in the nose. Trauma, of course plays an important role at this period. This is naturally due to the prominence of the nose on the facial aspect. There are peculiar anatomical reasons for the great tendency of the mucous membrane of the nasal fossa to bleed more readily than the mucous membrane of other parts of the body. The one well known factor is the enormous vascularity of this organ. The arterioles and venules run very often superficially and are thereby exposed to injury on the slightest provocation. There is also a possibility, that owing to the constant exposure of these blood vessels to frequent atmospheric influences, the tonicity of these vessels is not in a normal state, and therefore unable to give necessary aid in contracting down on its injured surface and hence bleeding continues more freely than in other parts of the body. In this connection it might be of interest to mention the familiar observation, namely: the infrequent occurrence of epistaxis in acute inflammatory states of the mucous membrane of the nose. The probable reason for that, is the edematous state of the tissues. The swelling of the mucus follicles causes an encroachment on the intervascular spaces and thereby compress the finer blood vessels. On the other hand, in chronic inflammatory conditions where the atrophic factor is especially a predominating feature, epistaxis is of a common occurrence.

In reference to the bleeding points, the areas most often involved, are the anterior part of the septum, the floor of the nose at the nares, in the sulcus, where the septum joins the floor. These areas are subject to erosions and ulcerations most likely on account of the fact that they are easily accessible to picking, a pernicious habit easily acquired and indulged in by many subconsciously. This habit is not confined to the ignorant, ill-bred. It is indeed practiced by those who are otherwise intelligent and respectable members of society.

Diagnosis: In regard to the diagnosis of epistaxis, it is safe to state that a flow of blood from the anterior or posterior nares is sufficient evidence that one is dealing with a case of epistaxis. However, Olser[4], mentions that there are instances where a severe at-

tack of epistaxis is unrecognized because the blood is swallowed and then the vomiting of blood occurs and gives the impression that one is dealing with hematemesis of gastric origin. Occassionally blood trickles down into the larynx and bronchi, especially in people with diminshed sensibility of these parts owing to atrophic degeneration of the mucous membrane in these areas. The blood is then coughed up and the patient becomes suspicious of pulmonary tuberculosis. In the above rare instances it requires a careful posterior rhinoscopy; if necessary, to apply a solution of cocain to obtain a good view and permit a thorough examination.

Prognosis: The prognosis of epistaxis will naturally depend on the type, the etiological factor, and the associating diseases that one would encounter in a given case. The great majority of hemorrhages are easily controlled. Fatal cases do occur but unfortunately these cases are not often recorded in the literature. Freudenthal[6] reported a fatality of a case of epistaxis due to telangiectasis of hereditary type. The cases that threaten life are those that are caused by hemophilia and do not respond to the serum injections and transfusions, certain hereditary types, the telangiectatic types; and in rare instances, cases of uncontrollable hemorrhages occur after extensive intranasal operations and in whom there is no history or demonstrable evidence of hemophilia.

Treatment: A few general remarks about the treatment of epistaxis may be in order. The first consideration in the successful treatment both as regards the immediate stoppage of the hemorrhage and its recurrence, is the cause of the bleeding. As pointed out above, in children unilateral bleeding should arouse the suspicion of a foreign body of some kind and the different objects that one is apt to find in a child's nose are too numerous to mention. At times a positive determination of the presence or absence of a foreign body is no easy matter in an uncontrollable youngster. One should not hesitate to apply local anesthesia and if necessary a general anesthetic may be administered for the purpose. An X-ray will be of benefit in case the foreign body is of a metallic nature. Another important cause in children should not be overlooked and that is diphtheria. One cannot rely entirely on the appearance of the mucous membrane, a culture is always in order. On the other hand the writer can recall at least two cases where the culture was repeatedly negative and the condition did not clear up until antitoxin was administered. So that one must use considerable judgment in these protracted cases of oozing with the presence of thick pus or a membranous obstruction in the nose.

In an erosion of the septum where the bleeding recurs after cauterization one should not fail to take the blood pressure because if this is found to be abnormally high, appropriate treatment to reduce the pressure will bring immediate results. One golden rule is worth while to follow and that is, to submit every case of recurrent hemorrhage of the nose, irrespective of the nasal findings, to a most thorough general medical and laboratory examination in order to determine whether there is any disturbance of the function of any other organ in the body that may have bearing on the epistaxis. In this way many unpleasant mistakes will be avoided.

Bleeding from the nose that is not controllable by the ordinary home methods requires cauterization. Each of us have of course gotten accustomed to the routine application of certain chemicals that possess the power to destroy mucous membranes superficially. The agent selected must possess the power of penetration, sufficiently deep to stop the bleeding instantaneously at the point of application. It should not go too deep and should not disseminate in the neighboring area that is not abnormal. If the agent penetrates too deeply the result is protracted healing, obnoxious scarification and if the cauterization extends to the opposing surface of the nasal fossa, the result may be a synechia between the turbinate body and the septum. In these days of ever increasing nasal operations it is well to remember that the ounce of prevention is worth while in this sphere. Post-operative hemorrhages will be avoided if the delicate tissues of the nose are not traumatised unnecessarily and lacerated areas are avoided, or repaired as soon as it occurs. A certain number of operators are in the habit of obtaining local anesthesia for a submucus resection by the method of the layer packing and they specifically depend on very tight packing of the nose with cotton saturated with a low percentage of cocain. The tight packing becomes an essential factor with such percentage, because he has to rely on the enormous pressure to allow some of the cocain to act. This method is invariably followed by an extreme reaction on the part of the mucous membrane. The pressure exerted on the tissues traumatizes them to a great extent and renders them more prone to hemorrhage. Anterior and posterior packings are still the best methods of arresting hemorrhage. A method of saturating the packing material in sterile petrolatum is of great benefit, because it adds a material capable of blocking small bleeding points and in addition, its withdrawal is not apt to open the bleeding points as happens so often in the use of dry packing.

In severe spurting hemorrhage if it occurs in an accessible region, suturing is the ideal method. The administration of morphin

hypodermically helps to arrest hemorrhage in the nose as it does in other parts of the body.

The treatment of a certain type of bleeding that is associated with a hypertrophic condition of the inferior turbinates deserves to be mentioned. The turbinate is large and appears degenerated at the anterior tip. The first impression is that the tip would have to be resected in order to prevent the recurrence of the hemorrhage. The bleeding point in this instance is actually hidden by the tip and its removal will not stop the bleeding. It is only necessary to shrink the tip thoroughly and the bleeding point will be found at the bottom of the septum and cauterization of this area will effect a cure.

CONCLUSIONS.

1. While epistaxis in itself is not a disease it is a valuable symptom of many diseases, and may at times be a guide in diagnosis of obscure conditions.

2. In epistaxis of constitutional origin, it sometimes requires painstaking search, general medical and laboratory examinations in order to establish the exact cause of the bleeding.

3. The rhinologist and the internist must work hand in hand if their efforts are to be crowned with success. There must exist team work.

4. The subject deserves greater consideration and more study than hitherto accorded in the literature.

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TREATMENT OF SYPHILIS FROM THE STANDPOINT OF OTOLOGY AND LARYNGOLOGY.*

DR. JAS. A. BABBITT, Philadelphia.

Specific involvement in the otolaryngologic field presents a varied lesion which is but an expression of the underlying systemic disease, and routine treatment for primary, secondary and even tertiary lesions of the ear, nose and throat must be considered chiefly palliative. Such treatment differs little from the customary indications for mucous surface and deeper lying tissue change of more varied origin. Special treatments of local nature have been advocated, such as subcutaneous pilocarpine injection, mercurial wash and organic iodin compounds, and used with varying success; but as all these vascular and tissue changes converge in one fundamental reference to the spirochaetic invasion, the specialist of conscience in this field inclines to submerge all treatment, save obvious hygienic prophylaxis, in the systemic issue.

Consensus of opinion would, however, make one important exception in this general category of cardio-vascular resultant—the disordered labyrinthine function as intimate in its relation to the fundamental specific background as focal infection to its general metabolism syndromes; and in somewhat similar analogy. Guthrie estimates that 5 per cent of all syphilitics are affected in the inner ear, the receptive, not the sound-producing apparatus. It has been affirmed that one third of all cases of nerve deafness have a plus Wassermann. If one interprets correctly the purpose of this symposium, it is appropriate to omit enumeration of detailed therapeusis of ordinary topical character and discuss indication and contra-indication from this vital labyrinthine standpoint for treatment by mercury and iodin or arsenic.

Certain premises of importance might be cited:

1. The labyrinthine artery, as emphasized by Kyle, is the single artery of the labyrinth and a direct branch of the basilar. The labyrinthine circulation has been elaborately studied by Escat, Pollitzer, Shambaugh and others, showing its integral relation to the brain system. It should be susceptible to similar changes as, for example, we find in the central artery of the retina. And branches of the labyrinthine artery supply the cochlea, vestibule and semicircular canals.

*Read before the College of Physicians.

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2. Syphilis appears early as an involvement of the meninges, producing thickening of surface structure with pressure on important nerves of exit at their foramina, and producing from this swelling pressure neuritis and secondary atrophy. In corollary to above, labyrinthine involvement, perhaps minor in degree has been co-existent with the disease in its early stages, and is often associated with polyneuritis of other cranial nerves, notably the second and seventh —though conclusive indication for treatment measured by the effect upon the eighth nerve and its cochlea and vestibular distribution is peculiarly difficult to obtain because of the rather meager investigations reported on labyrinthine integrity, both prior to syphilitic invasion and under its primary stages, with and without treatment, thus co-ordinating the time cycle of meningeal evidence. It is scarcely possible at this point to divorce the pathological from the therapeutic side of discussion, and such intrusion in the neuro-otologic field may be more justified as it is not specially captioned in the symposium.

The para-syphilitic question became one of profound importance in the pathological determination for systemic medication. Indeed, the functional tests of labyrinthine integrity afford one of the earliest diagnosis of the latent and resistant spirochaetemia of cerebro-spinal syphilis. Swift and Ellis, summarizing investigations in cerebro-spinal fluids, find excess of globulin and cells in a low percentage of cases in primary syphilis, and in from 36 to 67 per cent is secondary stage. Davis, however, after analyzing Willicut's reports of findings in 300 syphilitic cases in Urbantschitsch's Vienna Clinic, estimates a definite reduction in bone conduction in 90 per cent of syphilis in the primary stages. Wintermute again has reported the observations of Benario on 210 cases of general neuritis following salvarsan administration and 121 following mercury, 79 of the 210 salvarsan cases and 46 of the 121 mercurial were of the acoustic nerve. This indicates nearly an equal result after the administration of the two drugs.

Actual nerve degeneration in neuritis begins in nerve pathway and loss of basilar membrane structure is probably irremedial. The question arises: Can partial stages be arrested, and can therapeutic treatment produce further loss of function?

Salvarsan and neo-salvarsan, or as lately termed, arsphenamine and neo-arsphenamine, quickly and effectively produce their change in the general circulation, and in this result the outer ear, nose and throat receive their merited share. They do not, however, so effectively reach the central area which directly contributes to in-

ternal ear changes. Many authors report sudden and increased deterioration in the distribution of the eighth nerve. Ears with non-specific labyrinthine involvement are apparently made worse and syphilitic bilateral affected ears have been reported as made stone deaf on their administration.

The answer to this may be in the so-called "neuro-recidiv" explained by the Herxheimer reaction. This reaction, an increase of local manifestations about the site of injection, is believed to be due to liberated endotoxin upon the death of spirochaetes, which carry soluble toxin and the lighting up of these in the internal ear circulation increases round cell infiltration in the vessel wall and registers further temporary damage. Such damage, if it be in earlier stages, may be followed by improvement if dosage be sufficient to kill all spirochaetes or if repeated injections produce such results. In late cases it is reported that deafness will probably be permanent.

In view of the fact that neoarsphenamine has proven of so much simpler administration, and is so universally administered by physicians, general and special, the writer felt it would be of value to obtain a consensus of report from leading oto-laryngologists in our own country as an expression of recent opinion.

The mercurial and iodid treatment is already historical. What we desire to know is whether or not the powerful and effective arsphenamine treatment is a real aural danger. In a questionnaire these men were asked to what extent they had observed positively unfavorable results from the use of salvarsan or neo-salvarsan (for surety the older terms were used). Ninety-two replies were received from letters sent to men of particular prominence. In reply the following results were obtained: 57 per cent had obtained no unfavorable results, (8 reported no unfavorable results based upon large and apparently reliable experience.) In this group, 6 reported particularly favorable results, 6 reported a marked preference for KI and mercurial treatment, 23 per cent reported definitely unfavorable results. Many of these reported with detailed experience and 3 referred to similar results observed in Vienna clinics. Some of the notes accompanying were careful and influence conclusions below. 5 per cent declared no experience, some giving no special attention to the ear, 6 per cent carried no opinion of value. These reports are not final in any way, but reflect current opinion upon this topic so vital to our field.

In Conclusion:

1. In the oto-laryngologic field systemic medication is chiefly important in syphilis and special dangers of such medication may apply to the labyrinthine function.

2. The neuro-vascular mechanism of the eighth nerve must be considered an intimate part of the central basal system and as sharing the effects of early meningeal involvement.

3. Arteriosclerotic changes, as evidenced in precautionary labyrinthine tests, deserves more emphasis as contra-indication to the liberal use of arsphenamine and the customary and nephritic contra-indications apply to the internal ear as well as general system.

4. There is a natural doubt in reported cases of arsenical labyrinthine sequelae as to how much labyrinthine change was persistent.

5. In labyrinthine shock, if induced by prodigal liberation of endotoxins, subsequent improvement may not proceed beyond pre-existing change due to meningeal involvement.

6. Results from questionnaire, while scarcely giving sufficient trustworthy data for final decision, emphasize the average safety in arsphenamine administration.

7. Unfavorable labyrinthine functional tests warrant preliminary mercurial and iodid treatment, followed by arsphenamine in cautious dosage.

8. An exhaustive research in labyrinthine symptomatology during early stages of syphilis would doubtless add information to para-syphilitic knowledge.

9. Evidence of Herxheimer reaction and liberated endotoxin have not sufficiently proven actual arsphenamine injury to the internal ear, though weight of evidence warrants its occasional assumption.

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THE TREATMENT OF NASAL OBSTRUCTION BY SUBMUCOUS RESECTION OF THE INFERIOR TURBINATE BONE. REPORT OF CASES.*

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Nasal obstruction or difficulty in breathing freely through the nose, is one of the most frequent complaints among patients suffering with nasal trouble. No matter what other complaints or discomforts might be associated with this symptom, the inability to breathe freely and comfortably through the nose appears to annoy the patient most of all. It is with this complaint that the patient comes to seek the advice and treatment of the specialist, and unless the latter succeeds in affording relief, the patient will soon desert him and look for help elsewhere. It is this class of patient who very frequently falls a prey to the over-zealous rhinologist who does not feel content until he has excised, resected or cauterized every intra-nasal structure that can be found in the nose.

In this communication the writer does not intend to discuss all the causes and varieties of nasal obstruction, but rather wishes to confine himself to a brief discussion of one of the most common, if not the most common cause of nasal obstruction, namely hypertrophy of the inferior turbinate; and discuss its diagnosis and treatment by submucous resection of the inferior turbinate, accompanied by a report of a series of cases treated by this method.

Enlargement of the inferior turbinate body is a physiologic filling and emptying of the venous plexuses in the submucous tissue of the membrane, known as "swell bodies", or erectile tissue of the nose, the enlargement being within limits unobstructive to the air current. The inferior turbinate may also become enlarged due to irritation of the nasal mucosa, which reflexly causes the cavernous tissue to swell in a protective manner; such swellings disappear with the cause. General venous congestion and sedentary habits, are frequent causes of enlarged inferior turbinates. Compensatory or unilateral enlargements are found with a pronounced deviation of the nasal septum, the opposite turbinate being retracted and very small.

Very frequently these enlargements become intermittently chronic and habitual, occurring independently of irritation, giving rise to

*From the Oto-Laryngological Department of the Beth Israel Hospital.
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true hypertrophic and hyperplastic changes in the turbinal mucosa with resultant chronic obstruction to nasal respiration.

Another form of enlargement of the inferior turbinate, one frequently overlooked, which causes chronic nasal obstruction, is due to pathological changes in the cribriform bony frame-work of the inferior turbinal body. The latter may manifest itself either in the form of a very marked thickening due to hyperplastic changes in the bone, often reaching to a great many times the normal thickness of the bone, or as distortions and deflections due to malformation of the bony frame-work. The latter is usually found associated with septal spurs compressing the posterior or middle third of the concha inferior, thus causing the anterior third to grow out in an irregular manner, resulting in permanent anterior nasal obstruction. Corrections of the nasal septum with removal of a spur, without correction of the deformed inferior turbinate will give no relief to the patient in cases such as this. These pathological bone changes when present may be associated with or without changes in the mucosa lining the turbinate bone itself.

For practical purposes it seems quite difficult if not altogether impossible to make a classification of hypertrophy of the inferior turbinate, answering all requirements. It is even at times difficult to distinguish between simple chronic or turgescent rhinitis, and chronic hypertrophic rhinitis of the so-called hyperplastic type. Both forms may pass from one to the other, or exist at the same time. In reality they represent different forms of the same disease. They are however all characterized by one process which should be understood, that it is a chronic condition characterized by swelling and exudation, associated with a very distinct and even characteristic history, symptoms and clinical findings.

History. The chief and at times the only complaint, is inability to breathe freely and comfortably through the nose. The obstruction is remittent or intermittent in character; worse when in the recumbent position, always affecting the naris on the side the patient is lying, and changes to the opposite naris on turning the head. When in the erect position one or both nares may be blocked, or change from side to side. The nares may suddenly become clear on forcefully inspiring air, especially when entering a room where the temperature is lower, or when going out of doors in cool weather. In the early periods of this condition the patient may be entirely free from any obstruction for days or weeks at a time. It is not very uncommon to get a history of one or more previous nasal operations, which gave no relief. One of the patients reported here had been

TABULATION OF 20 CASES OPERATED ON FOR NASAL OBSTRUCTION BY SUBMUCOUS RESECTION OF THE INFERIOR TURBINATE BONE.

No.	Name	Sex	Age	History	Clinical Findings	Previous Operations	Date of Operation	End-Result
1.	B. S.	M.	20	Nasal obstruction.	Large turgescent inferior turbinates. X-ray—neg.	Submucous resection nasal septum. No result.	June 15, 1923. Submucous resection both inf. turbs.	Nov. 26, 1923. Breathes perfectly well. Cured.
2.	9060	M.	30	Nasal obstruction, epistaxis.	Deflected septum. Very large inferior turbinates.	None.	Oct. 26, 1923. Submucous R. inf. turbs.	Nov. 26, 1923. Cured.
3.	D. K.	F.	27	Right nasal obstruction.	Hypertrophy ant. portion R. inf. turb. X-ray—cloudy R. antrum. Deflected septum.	Septum resected, T. and A. removed, also post-tips inf. turbs. Cauterized four times.	June 12, 1923. Submucous resec. ant. tip. R. inf. turbinate.	Dec. 14, 1923. Feels excellent. Breathes pe fect.
4.	P. F.	F.	23	Nasal obstruction, frequent colds.	Deflected septum. Complete nasal blocking due to very large inf. turbs. Deformed bony lamina.	T. and A. removed. No improvement. Feels worse.	June 21, 1923. Submucous resection both inf. turb. bones.	Aug. 25, 1923. Breathes well both nares. Cured.
5.	M. S.	F.	29	Chronic nasal obstruction, colds.	Hyp. inf. turbs. Deflected septum.	None.	June 19, 1923. Submucous resection both inf. turbs.	Aug. 21, 1923. Cured.
6.	M. L.	F..	35	Chronic nasal obstruction.	Hypertrophy both anterior portion of inf. turbs.	None.	Oct. 14, 1923. Submucous both inf. turbinates.	Nov. 30, 1923. Cured.
7.	H. N.	M.	24	Chronic nasal obstruction.	Hyp. inf. turbs. Deflected septum. X-ray—cloudy antra.	Punctured and washings of both antra. No result.	Oct. 6, 1923. Submucous both inf. turbinates.	Nov. 26, 1923. Cured.
8.	E. J.	F.	20	Chronic nasal obstruction.	Hyp. inf. turbs. Pus in both nares. X-ray—cloudy L. antra.	None.	Nov. 3, 1923. Submucous both inf. turbinates.	Nov. 29, 1923. Cured.
9.	B. R.	M.	22	Intermittent nasal obstruction.	Hypertrophied inferior turbinates.	Submucous resection nasal septum. No result.	July 2, 1923. Submucous both inf. turbinates.	Nov. 26, 1923. Cured.
10.	I. A.	M.	28	Nasal obstruction for two years.	Turgescent R. inf. turb. Septal spur to left. Pus in nares. X-ray—cloudy R. antrum.	Submucous nasal septum. R. antrum washed. No result.	Oct. 20, 1923. Submucous resec. R. inf. turb.	Nov. 5, 1923. Cured.
11.	G. G.	M.	27	Nasal obstruction.	Hyp. ant. tips in. turbinates. X-ray—negative.	Submucous nasal septum, two years ago. No result.	Oct. 2. 1923. Submucous both inf. turbinates.	Nov. 26, 1923. Cured.
12.	S. H.	F.	42	Nasal obstruction.	Hyp. left inf. turbinate.	None.	April 13, 1923. Submucous L. inf. turbinate.	July 7, 1923. Cured.

				for two years.	Septal spur to left. Pus in nares. X-ray—cloudy R. antrum.	R. antrum washed. No result.	Submucous resec. R. inf. turb.	Cured.
11.	G. G.	M.	27	Nasal obstruction.	Hyp. ant. tips in. turbinates. X-ray—negative.	Submucous nasal septum, two years ago. No result.	Oct. 2. 1923. Submucous both inf. turbinates.	Nov. 26, 1923. Cured.
12.	S. H.	F.	42	Nasal obstruction.	Hyp. left inf. turbinate.	None.	April 13, 1923. Submucous L. inf. turbinate.	July 7, 1923. Cured.
13.	J. G.	M.	23	Nasal obstruction, asthmatic attacks.	R. high deflected septum. Very large hyp. inf. turbinates.	Septum resected 8-14-23. No result. Feels worse.	Oct. 4, 1923. Submucous L. inf. turbinate.	Nov. 3, 1923. Cured.
14.	R. C.	F.	16	Nasal obstruction, mouth breathing, very poor physical state.	Large hyp. inf. turbs. Diseased tonsils.	T. and A. operated, 5-3-23. No improvement at all. Breathing obstructive.	June 6, 1923. Submucous resec. of both inferior turbs.	Sept. 15, 1923. Completely cured.
15.	R. S.	F.	32	Nasal obstruction.	R. turb. deflected in a horizontal plane. Mucosa very turgescent.	Cauterization of both inferior turbinates, 1-4-23. No improvement.	June 7, 1923. Submucous resection both inferior turbs.	Sept. 3, 1923. Excellent result. Cured.
16.	I. F.	M.	25	Intermittent nasal obstruction for six years.	Marked hyp. both inf. turbs. Septum resected.	Bilateral middle turbinectomy. No improvement.	July 7, 1923. Submucous both inferior turbs.	Nov. 29, 1923. Cured.
17.	J. M.	M.	56	R. sided nasal obstruction for many years.	R deflected septum, spur. Both inf. turbs. hypertrophied. X-ray cloudy antra.	Both antra punctured and washed. No improvement.	Nov. 29, 1923. Submucous R. inf. turb.	Immediate result good.
18.	Z. W.	M.	27	Difficulty of breathing through nose for two years.	Hypertrophy both inferior turbinates. Deflected septum, right high.	None.	Aug. 7, 1923. Submucous resection both inf. turbinates.	Dec. 1. 1923. Breathing is perfect. Cured of nasal obstruction.
19.	H. W.	M.	20	Nasal obstruction. Post-nasal dripping.	Hypertrophy inferior turbinates impinging on septum. Mucosa normal.	Submucous resection of nasal septum three years ago. No relief.	July 3, 1923. Submucous resection both inf. turbinates.	Nov. 15, 1923. Result excellent. Cured.
20.	F. P.	F.	32	Chronic nasal obstruction.	Inferior turbinates very large, abutted against nasal septum. Mucosa normal.	Submucous resection of nasal septum one year ago with no improvement.	Aug. 9 and 17, 1923. Submucous resection both inf. turbinates.	Nov. 15, 1923. Result excellent. Cured.

Note: Cases 1 to 9 inclusive were operated on by the author.
Cases 10 to 15 inclusive and case 18 were operated by Dr. S. Stein.
Cases 16 and 17 were operated by Dr. H. H. Beinfeld.
Cases 19 and 20 were operated by Dr. Ralph Almour.
} of the Oto-Laryngological Department of Beth Israel Hospital.

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operated upon six times, another four times. The majority have had at least one operation, of which the submucous resection of the nasal septum was most often done. Cauterizations of the inferior turbinates, turbinectomy, middle or inferior or both, and ethmoidectomy are other operations mentioned by the patients and substantiated by clinical examinations.

Clinical Findings. Rhinoscopic examination usually reveals an enlarged unilateral or bilateral inferior turbinate. At times no enlargement at all of the inferior turbinate can be found which to the inexperienced may mean a negative finding and be construed as such. The patient will, however, tell us that the nares were blocked but a

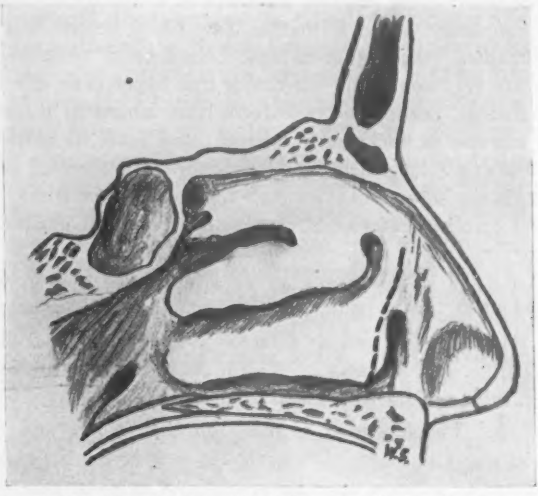

Fig. 1. Dotted line showing the incision made for the submucous resection of the inferior turbinate bone.

few minutes previous to entering the examining room and is bound to recur at any moment. An unilateral enlargement of the inferior turbinate may be found with marked deviation of the nasal septum, and is due to compensatory hypertrophy. In patients suffering with chronic or remittent chronic nasal obstruction, enlarged inferior turbinates will always be found on rhinoscopy. In these cases as well as in normal patients some form or other of deviation, spur or ridge of the nasal septum is to be found. Here it may be said that to attack the nasal septum in preference to any other intra-nasal structure, on the mere findings of some little spur, ridge or deviation of the septum nasi, would not only be an injustice to the patient.

but also poor surgical judgment. The great number of failures met with in nasal surgery today, is largely due to the foregoing indiscretion. Even in very carefully selected cases the results of the submucous resection is not very gratifying.[1]

Pathology. The pathology of hypertrophic rhinitis is well established and needs no further comment. A few words may, however, be said about the bone changes that accompany hypertrophy and hyperplasia of the inferior turbinal mucosa.

In the early stage, or stage of inturgesence or intumescence where the swelling of the mucosa is principally due to an increased hyperaemia, accompanying bone changes are very slight or none at all. When the enlargement assumes the shape of a true hypertrophy due to new connective tissue formation, new blood vessels and round cell infiltration, resulting in chronic enlargement, secondary bone changes are very common. We find a true hyperplasia due to new bone formation, causing the cribriform bony lamina of the turbinal body to increase in thickness to a great many times its normal size, thereby causing enlargement of the inferior turbinate with pressure on surrounding structures; we thus frequently meet with a rather large hard turbinate inferior, covered with an atrophic mucosa lining it.

Primary bone changes such as hyperplasia, malformations and deviations of the bony lamina is a very common occurrence and plays a most important role as a factor in producing nasal obstruction, as a rule they are associated with changes in the mucosa, but may be present without any lesion of the mucosa.

Diagnosis. The diagnosis is made on the history and clinical findings as above outlined. On swabbing or spraying the nose with cocain-adrenalin solution there always follows in about two to three minutes a marked shrinkage of the enlarged or hypertrophied inferior turbinal mucosa. Even in cases with marked hyperplastic and polypoid changes, the mucosa and polypoid tissue will shrink sufficiently to enable the patient to breathe freely and comfortably. It is not an infrequent occurrence after spraying a patient's nose to hear him say, "Oh, if I could only breathe like this all the time." In the presence of a deviated, distorted or thickened bony lamina of the inferior turbinate the latter will stand out very prominently in spite of the shrunken turbinal mucosa, and will be visibly found to cause nasal obstruction.

Treatment. The chief objection to many of the operations as at present performed on the nasal passages in general and the inferior turbinate in particular for the alleviation of nasal obstruction, is

that frequently too much tissue is removed. This holds true for such operative procedures as cauterization, partial amputation, or the so-called clipping of the inferior turbinates, the spoke shave operation, Ballenger's swivel knife operation, the flap resection operation of Otto T. Freer[2], etc. The submucous anterior turbinectomy operation first described by W. Stuart Low[3] and apparently later (1911) modified, but not very much improved upon by Freer, comes closest in the opinion of the writer, to the ideal manner in dealing surgically with an hypertrophy of the inferior turbinate. It was this most interesting and illuminating article of Dr. Low that coincided so much with the views of the author on the same subject that prompted him to write this article. The technique as devised by Low, has, however, several disadvantages. 1. The large incision made along the inferior border of the turbinate, exposes the patient unnecessarily to the dangers of post-operative hemorrhage. 2. Only the anterior portion of the inferior turbinate is removed whereas at times it might be necessary to remove the entire bony lamina. 3. There is great difficulty experienced in separating the flaps, as the periosteum is very closely adherent to the bone, dipping down into the many small bone depressions or perforations, and so making it at times impossible to preserve the flaps from mutilation or total destruction. There also occurs at the same time of separation a great deal of bleeding so that it becomes very difficult to continue the operation, and bring it to a successful termination. 4. It has a rather prolonged post-operative course of healing similar to the Freer operation; marked nasal discharge and crust formation continue a long time post-operative.

The Submucous Resection of the inferior turbinate bone carried along similar lines as the submucous resection of the nasal septum is in the opinion of the writer the best surgical procedure in overcoming all the difficulties associated in performing this operation. A considerable lightness of touch, dexterity and surgical skill is a prerequisite before one attempts this operation. Its technique can however be mastered with a reasonable amount of practice.

TECHNIQUE.

Anesthesia. The most satisfactory anesthesia and ischemia was obtained by surrounding the turbinate with pledgets of cotton moistened in cocain adrenalin solution (equal parts cocain 10 per cent, and adrenalin 1/1000), and left in for twenty minutes. The anterior nares in front and well above the head of the turbinate should be anesthetized as well. Injection of novocain into the field of operation has been found unsatisfactory.

There are three distinct steps to be carefully followed when performing this operation. 1. Incision. 2. Elevation of mucosa and muco-periosteum on outer and inner surfaces of the turbinal bony lamina. 3. Removal of bony lamina.

1. A vertical incision is made beginning high up above the anterior attachment of the inferior turbinate and along the pyriform aperture, going through the mucosa and periosteum and well down to the bone, carried down along the entire anterior border of the turbinate.

2. The success of the operation depends largely upon separating at the proper layer in order to get sufficient elevation of mucosa. It is absolutely necessary to get between the periosteum and bone when first beginning the separation. Starting with a sharp Freer elevator, the mucosa and periosteum are elevated beginning at the upper angle of the incision, first extending backward, then downward along the inner surface of the turbinate to its lower dependent border. When the right layer is struck one experiences the same sensation in its separation as when elevating the muco-periosteum in the septum operation. There should be very little or no bleeding and tearing of mucosa. To avoid the latter, a blunt Halle elevator is used in separating as soon as the right layer is struck with the sharp elevator. The mucosa and periosteum are then elevated from the outer surface of the turbinate, by either passing around the inferior border of the bone, or starting separation along the anterior free border of the bone exposed by the incision.

3. The bony lamina freed from its covering, and now actually suspended in a sac of mucous membrane is detached from its base with a long thin scissors. The bone if entirely freed from its covering, and attachment, will drop into the sac and can be removed with any forceps. If still attached to the mucosa posteriorly it can be easily removed by grasping it with a forceps and slowly with a slight jerking motion extracted. If it is not desirable to remove the entire bony lamina, small parts of it can be bitten away with a sharp biting forceps. The incision can be closed with a single silk suture if one desires. The nose is then packed with a Simpson intra-nasal tampon.

The post-operative treatment consists in removing the packing in 48 hours and cleansing the nose for a few days with some bland solution. Healing takes place very quickly, in two or three days there is no sign left of the incision. The disagreeable nasal discharges, scabbing and crust formation are conspicuous by their absence. The preserved muco-periosteum forms a miniature turbinate,

thus preventing atrophy of the turbinal mucosa. The result is apparent the first week post-operative. The patient breathes well and freely, his entire psychology and aspect on life is changed for the better. The results obtained by us in this series of cases selected at random, giving the characteristic history and clinical findings as above outlined, were good in every case operated on.

SUMMARY.

1. Patients suffering of remittent, intermittent and chronic nasal obstruction due to hypertrophy of the inferior turbinate body give a characteristic clinical history and clinical findings.

2. A submucous resection of the nasal septum for the correction of an associated septal deformity, does not cure the nasal obstruction. The patient goes on suffering because of his obstruction and at times has an aggravated form of his distressing symptoms.

3. The performance of the submucous resection of the nasal septum in this class of cases, adds another failure to the already great number of failures in rhinologic surgery.

4. *The submucous resection of the inferior turbinate* is the best and only rational surgical procedure in eliminating nasal obstruction when due to hypertrophy of the inferior turbinate, associated with or without a deviated nasal septum. Only in rare instances a correction of the nasal septum is necessary in these cases.

5. The results obtained by us in this series of cases have been so good, that the writer undertook the publication of this paper particularly with a view of launching a plea for a continuation and a thorough trial of this operation by other rhinologists.

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NASAL OBSTRUCTION AS A FACTOR IN HAY-FEVER AND ALLIED CONDITIONS.*

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Among the many etiological factors to which the symptom-complex known as hay-fever is attributed, anaphylaxis, or sensitization to various pollens or proteins, has of late years occupied the chief attention of the American medical literature. Thus: Canfield[1] concludes that bronchial asthma and hay-fever are due to anaphylaxis. Walker[2] in a study of 49 cases of hay-fever found them to be due to emanations from horses, food proteins, chicken feathers and bacterial proteins. Shea[3] attributes vaso-motor rhinitis to protein sensitization. Bernton[4] likewise attributes hay-fever to specific protein sensitization, and further accounts for the frequent "colds" of these patients between attacks as due to secondary accessory sensitization with massive pollinosis from a group differing from the one to which the patient is ordinarily sensitive. Sluder[5] discussing "bronchial asthma as a nasal reflex" concludes that the symptoms are due to irritation and consequent reflex from the spheno-palatine ganglion. He does not, however, go into the causes of the irritation. Beck[6] believes that bronchial asthma and its allied conditions are due to a disturbance of the glands of internal secretion, while Pollack[7] puts the disturbed internal secretion as the underlying cause, and protein sensitization as the exciting cause of hay-fever.

In consequence of the emphasis laid upon protein sensitization as the specific cause of hay-fever, drug manufacturers quickly realizing their advantage have flooded the market with active principles of almost every known substance for testing the sensitiveness of these hay-fever sufferers, and have produced combinations of such products under the names of pollen antigens and antitoxins for the specific treatment of hay-fever.

The results of this treatment as regards cure, even as claimed by their most sanguinine adherents, has not at all been encouraging. Bernton[4], for example, in analyzing his results with an improved method of treatment in 56 selected cases, claims that 14 or only 25 per cent were relieved of symptoms. The fact is that when one questions a number of patients who have undergone this specific treatment, few indeed are found to have been relieved, and fewer still can boast of having been cured.

It is this state of affairs as well as the inertia of some physicians to further study their cases that has prompted the writer to look for

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other etiological factors of hay-fever besides protein sensitization and thus to account, if possible, for the many failures in the setablished method of its treatment. Vaughan[3] in discussing the subject says that the present treatment of hay-fever leaves much to be desired, for although a certain percentage enjoy amelioration of their symptoms, many experience no relief and some indeed are apparently made worse. Bernton[4] in trying to account for the poor results in the pollen treatment of hay-fever says: "The upper air passages of sensitive persons merit the attention of the specialist. Surgical measures should be employed to remove mechanical obstruction or to correct deformity."

Hay-fever and its allied conditions, such as rose-fever, spasmodic sneezing and rhinorrhea, manifest themselves in upper respiratory tract symptoms. The first place to direct our attention therefore, is the nose. Indeed, since functional pathology may be defined as perverted physiology, the latter must first be studied and it is the physiology of the nasal mucous membrane covering the lateral walls of the nose, the turbinates and the septum and extending into the sinuses which shall receive our attention.

The mucous membrane of the nose is covered with ciliated epithelium, the submucosa contains an extensive plexus of veins, forming a distinct cavernous tissue capable of reflex engorgement, its depth encloses serous and mucous glands, all enervated by both the central and sympathetic nervous systems, thus forming a complicated structure significant of its important and manifold functions. These functions are:

1. Regulation of the temperature of the inspired air.
2. Regulation of moisture in the inspired air.
3. Prevention of entrance of foreign bodies to the lungs:
   - A. By the ciliated epithelium,
   - B. By venous engorgement,
   - C. By the production of a copious serous nasal secretion.

1. The delicate bronchioles and alveoli of the lungs must receive the inspired air at a temperature approximately that of its own. The constantly changing atmospheric temperature, therefore, necessitates a mechanism able to warm, and under exceptional conditions to cool the inspired air so that its temperature approximates that of the body. This is accomplished chiefly by the nasal mucous membrane and to a lesser extent by the mucous membrane of the pharynx, trachea and larger bronchi. Thus an atmospheric temperature below that of the body causes a reflex engorgement and swelling of the nasal mucous membrane, the respiratory passages are narrowed, the inhaled air is drawn in slower and is therefore in longer contact with the engorged

tissue where it is warmed nearly to the body temperature. Inhalation of very hot air causes a similar engorgement of the nasal mucous membrane with consequent equalization of the temperature between that of the blood and the inspired air. This explains the many mouth breathers one notices in the hot room of the Turkish bath.

2. An identical mechanism regulates the amount of moisture in the inspired air which must likewise be at a normal constant when it reaches the alveoli. Too much or too little moisture in the atmospheric air causes a reflex engorgement of the nasal mucosa which in the one case absorbs the excess by osmotic pressure, while in the other it imparts the necessary moisture through the same law of physics.

3. Coarse foreign particles such as dust are caught and enmeshed by the cilia of the epithelial layer. Fine particles such as bacteria pollens or proteins to which the individual is sensitive, and possibly other toxins* which cannot be excluded by the cilia, cause a reflex engorgement of the nasal mucous membrane thereby mobilizing the general opsonic property of the blood to the first line of defense. The swollen mucous membrane also acts as a mechanical obstruction to these foreign bodies which are then washed away by a copious serous exudation produced by a reflex hypersecretion of the serous glands in the nasal mucosa.

As the atmospheric temperature and moisture constantly vary, the protective nasal engorgement and consequent narrowing of the respiratory nasal passages keeps pace with it. This is accomplished by a sympathetic reflex action upon the cavernous sinuses in the nasal mucous membrane, thus narrowing the nasal passages but leaving enough room for normal nasal breathing. Under normal nasal conditions, that is in the absence of a pathological obstruction, this physiological reaction occurs without any organ-feeling, that is without our consciousness of its mechanism.

If, however, the reactive physiological swelling of the nasal mucous membrane consequent upon atmospheric changes is superimposed upon a pathological obstruction, it causes complete blocking of the nares, sneezing, nasal hypersecretion and lacrimation, due to obstruction of the naso-lacrimal duct; in other words, an acute catarrh or a cold in the head. Similarly, an individual may be sensitive to some foreign protein with resultant engorgement and swelling of his nasal mucous membrane when in the presence of that protein. When no pathological nasal obstruction is present this physiological swell-

*This may account for the catarrhal symptoms ushering in an attack of measles or the other infection diseases, nature's fruitless attempt as it were to block the entrance of the toxin into the organism.

ing is not enough to completely block the nasal passages there may be only slight hydrorrhea, no sneezing, no lacrimation, indeed, none of the chain of symptoms known as hay-fever, although on testing these individuals sensitization to some foreign protein may be found. The point the writer wishes to emphasize is that an antecedent pathological nasal obstruction is a sine qua non and prerequisite in the production of the chain of symptoms known as hay-fever, rose-fever, or nasal hydrorrhea. In other words, sensitization to a foreign protein or pollen must be considered as the exciting cause and a previous nasal obstruction as the underlying cause of these conditions. Incorrect attribution of the proper cause and resultant effect accounts for the post hoc propter hoc reasoning of the anaphylaxis-hay-fever enthusiasts. The following case illustrates this point:

V. W. has been suffering from so-called hay-fever for two and a half years. She has been tested and found sensitive to goose feather proteins and was accordingly advised not to sleep on feather pillows and to submit to injections of this protein for desensitization. She has followed the former of these instructions but refused to have the injections. Her attacks continued until a submucous resection was done and a nasal spur removed. The patient has had no attacks since the operation, which was done three years ago. She has since been sleeping on feather pillows, although she has never been desensitized to that protein to which she is still unquestionably sensitive. While it is not to be denied that injections with feather protein would have likewise probably stopped her attacks, for a time at least, it nevertheless would not have prevented the reflex engorgement of the nasal mucosa consequent upon atmospheric changes or the "colds" to which the patient was subject, and from which, incidentally, she has enjoyed perfect freedom since the operation. The removal of the pathological nasal obstruction has, with one stroke, so to speak, prevented all possible attacks, no matter what the cause may be. Such typical cases may be multiplied many times and I am sure can be found in great numbers in the experience of all progressive rhinologists.

The foregoing considerations further explain (but not, however, by a hypothetical massive pollen action, as claimed by Bernton), the common experience that the slightest atmospheric change brings on an attack of sneezing in a hay-fever sufferer. When this attack occurs during the hay-fever season neither patient nor physician is able to differentiate between an ordinary "cold" and a true attack of hay-fever, for while each has a different cause, the result upon the nasal mucosa combined with the pathological nasal obstruction produces the same chain of symptoms.

These pathological nasal obstructions may be only slight so that under normal conditions, as between attacks, they may cause little interference with nasal breathing and are therefore, easily overlooked by both patient and physician. They include mild septal deviations, particularly in the lower or respiratory part, septal spurs, polyps, enlargement of the inferior or middle turbinates and enlarged posterior ends of the inferior turbinates. On the other hand, when both nares are pathologically obstructed, resulting in mouth breathing, and the individual exposed to a changeable atmosphere or to a sensitized protein or pollen, the mucous membrane of the bronchioles assumes the function of the nasal mucosa, becomes engorged, the swelling narrows the lumen of the bronchioles which becomes filled with a serous hypersecretion, thus producing the wheazing breathing, frothy expectoration and physical signs of bronchial asthma.

Occasionally, a submucous resection, though perfectly performed, fails to relieve the patient of his attacks. This may be due to the fact that while the septal deviation has been corrected and the spurs removed, other causes of nasal obstruction are left. Among these are:

1. Tuberculum septi. This is a swelling of the upper and anterior portion of the nasal septum, consisting of lymph-adenoid tissue. If the swelling extends down it may cause respiratory obstruction with its chain of symptoms. If it is only confined to the upper part of the septum it may cause upper nasal obstruction with symptoms referrable to sinus disease, or Eustachian tube obstruction. This swelling should always be removed immediately after the submucous resection has been completed.

2. Hypertrophied tissue over the inferior turbinate. After thorough cocainization and contraction of the cavernous tissue over the inferior turbinate, some pendulous tissue can frequently be felt with the probe. This consists of hypertrophied lymph-adenoid tissue blocking the nares and should, therefore, be removed.

3. Hypertrophied posterior ends of the inferior turbinates projecting into the naso-pharynx may cause nasal obstruction.

4. Polyps should be removed and their origin investigated, for it usually denotes disease of the maxillary sinus, which may be responsible for the rhinorrhea through its bacterial protein or toxin.

5. Thickening or subluxation of the lower lateral cartilage of the nose. If the outer wing of this cartilage is thus affected, it comes in contact with the septum and forms a barrier to nasal breathing. If the inner wing or crus is thickened or subluxated, the nasal entrance is obstructed. Both conditions are frequently overlooked because covered by the examiner's speculum. It is therefore best to

examine for such obstructions without the aid of the speculum, and, if found, should be corrected when the septum operation is done. Halle, of Berlin, never considers a septum operation complete until all these possible causes of nasal obstruction have been examined for and corrected.

SUMMARY.

1. Too much emphasis is laid upon protein sensitization as the all important cause of hay-fever and its allied conditions.

2. There is neglect of the study of hay-fever and its allied conditions from the physiological and functional standpoints.

3. The physiological reaction of the respiratory passages to irritants results in a reflex engorgement or swelling of the nasal mucous membrane and in an increase of its serous exudation.

4. The irritant may be either a changeable atmospheric condition, bacterial toxin, foreign protein, or pollen to which the patient is sensitive through previous parenteral ingestion.

5. The irritant causing a physiological swelling of the nasal mucosa produces no upper respiratory symptoms if no pathological nasal obstruction is present.

6. If, however, a pathological nasal obstruction be present, the physiological reflex swelling of the nasal mucous membrane, following exposure to a sensitive protein or pollen, causes complete interference with nasal breathing, sneezing, lacrimation due to mechanical obstruction of the nasal duct, and excessive serous nasal discharge; in other words, the picture of hay-fever, rose-fever, or nasal hydrorrhea.

7. If both nasal cavities are obstructed, as by deviation of the septum to one side and a hypertrophied turbinate or polyp on the other, the route of the inspired air is diverted to the mouth. This results in a physiological swelling of the mucous membrane of the bronchioles and alveoli, interference with the normal emptying of the lungs, and the production of the symptom-complex known as bronchial asthma.

8. The pathological nasal obstruction may be: a deviated septum, tuberculum septi, polyps, hypertrophied middle or inferior turbinates, or enlarged posterior ends of the inferior turbinates.

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115 West 73rd St.

A MODIFIED RADICAL OPERATION FOR CHRONIC SUPPURATIVE OTITIS MEDIA. PRESENTATION OF PATIENTS SHOWING RESULTS.*

DR. HUGH B. BLACKWELL, New York.

The conservation and improvement in hearing with the cessation of discharge is the object of the operation here described for the relief of the chronic discharging ear.

The hearing following a radical operation often leaves much to be desired: this is particularly true when a patient had a useful ear prior to the operation; furthermore the difficulty frequently experienced in securing a permanent closure of the Eustachian tube often leads to a return of the discharge. During the course of O. M. P. C. usually the external mastoid cortex becomes thicker, more rarified and condensed, while a cavity of varying size forms in the interior of the bone, usually in the region of the antrum which becomes filled with cholesteatoma, detritis, dead bone, etc. Pus is apt to form here under pressure and attack important adjacent structures, this nidus constantly reinfecting the middle ear and as long as it remains causes a continuation of the discharge. The futility of attempting to cure this condition by curretting the Eustachian tube is quite evident. Nature sometimes has a way of automatically curing this condition by producing a necrosis of the posterior bony canal wall near the epitympanic ring which permits drainage from the interior of the mastoid when sufficient bone sloughs away, this in effect and appearance often approximates the result obtained by the operation here described. It may be said with a certain amount of truth that this operation is an extended effort of Nature's method of healing O. M. P. C. The difficulty experienced in healing large perforations of the membrana tympani is well known, especially if they be marginal. It is our experience that when the interior of the mastoid has been permanently drained and aerated that marginal perforations involving half the drum will frequently heal. There seems to be a primitive natural effort on the part of the tympanic membrane to reconstruct itself when once the cause of its destruction has been removed, somewhat analogous to the restoration of the synovial membrane in cases of joint excision. This ten-

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dency is strikingly observed following a radical operation where every vestige of the drum has been removed, after the wound is healed tissue closely resembling tympanic membrane will frequently be found stretching across the bottom of the radical cavity.

Operative Indications: This operation seems to be especially indicated in cases of O. M. P. C. with a history of discharge ranging from several months to several years. Usually with a discharge of about five years or more such extensive necrotic changes have taken place in the middle ear, with resultant loss of hearing as to render

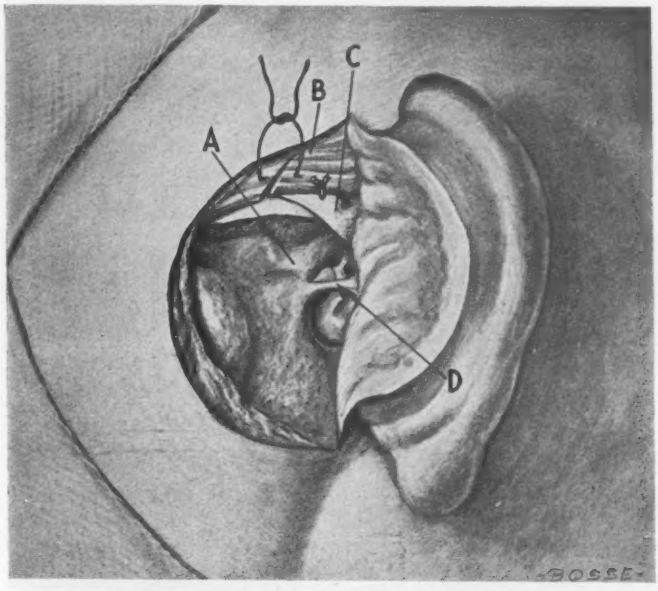

Plate 1. View of operation prior to closure of posterior wound. Epitympanic ring of bone has been left in position. Drum and ossicles are intact. A—External semicircular canal. B—Temporal muscle. C—Plastic meatal flap sutured to fascia of temporal muscle. D—Epitympanic ring of bone, showing the malleo-incudal body lying just above and internal, and the drum below.

the modified radical operation useless. From a functional standpoint however the operation is indicated in any case of O. M. P. C. with very good hearing which continues to discharge despite conscientious and persistent treatment as it is reasonable to suppose that a continuation of discharge will cause a dimunition of hearing in the affected ear. Cases which present a wide antrum are more favorable subjects for the operation. It should be the operation of choice in cases of exostosis of the canal associated with O. M. P. C.

and in perforation of the pre-mastoid lamina with necrosis of the posterior bony canal wall.

Operation: The usual post-aural incision is made as in the Stacke operation. The soft parts anterior to this incision are elevated and retracted forward: The cortex is removed with a gouge and the subcortical cells with curettes until the antrum is opened; the posterior canal wall is lowered and the antrum widened to its fullest possible extent. When the short process of the incus becomes visible, the external attic wall is removed by placing the back

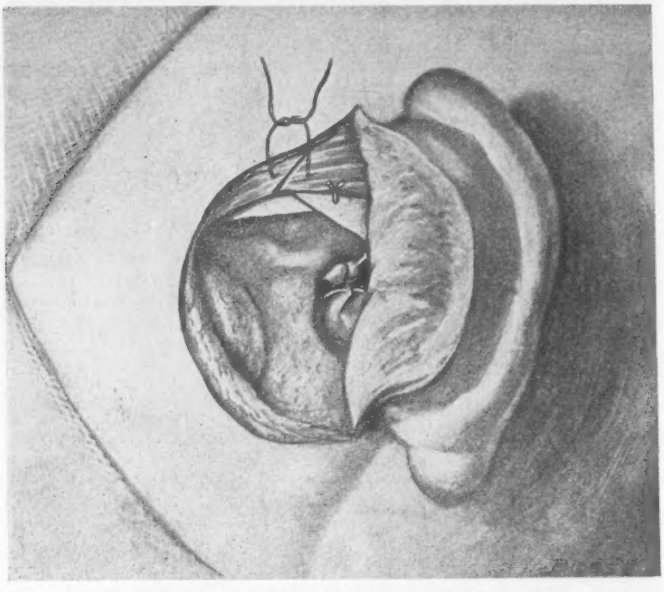

Plate 2. View of operaation completed, when the epitympanic ring of bone has been removed in the superior quadrant. Drum and ossicles are left in position.

of the curette external to and in front of the incus and curetting from within outward. The bony canal wall is still further lowered until the facial ridge is reached, leaving only the epitympanic ring in its superior portion with a width of about a sixteenth of an inch arching across the top of the drum from the posterior to the anterior canal wall. In our early cases we allow this epitympanic ring to remain but in recent years we have removed it in nearly all instances carefully separating it from the attached edge of the drum. The granulations, polypi, and cholesteatoma lying in the

external and internal attic are removed by curetting internal or external to the malleo-incudal body, care being observed not to destroy the suspensory ligament of the malleus. In curetting near the incus, great care must be taken not to disturb the ligament which binds the extremity of its short process to the bone below and just in front of the external semi-circular canal. The drum ossicles are, of course, not removed, but left insitu. An L shaped meatal flap is cut, as in a radical operation, the cartilage removed, and the flap sutured to the temporal fasia. The mastoid wound and antrum region are packed snugly, thereby furnishing support to the flap, and the posterior wound is sutured.

Daily dressing should be performed. During the process of healing one should be careful to keep the antrum and attic regions as free as possible from granulations, which are apt to become infected; reinfect the middle ear and prevent its aeration. Frequently after the first week all packing is removed from the canal and cleansing dry treatment instituted. An interesting development in the process of healing is growth of a secondary drum membrane in the attic region. The danger of injury to the facial nerve is much less than in the radical operation.

Conclusions: The conclusions which we have reached regarding the value of this procedure for the relief of O. M. P. C. are not based upon hasty observations made upon recent operations as with few exceptions one to twelve years have passed since the operation has been performed. We have performed about forty Modified Radical Operations.

We feel strongly that the infective products retained in the mastoid are largely responsible for the continuance of discharge in O. M. P. C., and when once this area, eg: antrum, attic, and post-antrum space is permanently drained and aerated, the middle ear shows a natural tendency to return to normal. Usually we prefer not to curette the Eustachian tube unless there are granulations present about its orifice as we prefer it to remain patent and allow it to heal normally as under these circumstances the end result, both as regards hearing and subsequent infection is much better.

The operation is not presented as one which would replace the radical procedure. While we have not found it necessary to do so, any of these cases can be readily converted into radicals during the process of healing by curetting out the middle ear structures under local anesthesia.

8 East 54th Street.

INTRINSIC CANCER OF THE LARYNX.*

DR. HARMON SMITH. New York City.

I have selected this subject for presentation, not because of any new theories I may have to offer nor because I feel myself especially qualified to present any new clinical data that will guide you unerringly either in diagnosis or treatment, but because statistics have recently shown a preponderating increase in cancer of the larynx and because former opinions upon this subject are being materially altered by more frequent and earlier observation of the lesion and by the addition of the X-ray and radium to our therapy. The title specifically states *intrinsic* laryngeal cancer, in which prognosis is more favorable than for extrinsic cancer and even more favorable than for cancer located in almost any other part of the body. In this selected type the lesion is circumscribed by the cartilaginous laryngeal box and is confined to the vocal cords, the ventricular bands, ventricles, inter-arytenoid space and the sub-glottic region. *Early* diagnosis of cancer in this region likewise adds additional value to the prognosis, and almost insures to the patient a favorable outcome if approached in a proper manner.

DIAGNOSIS.

Hoarseness in a man over forty years of age and in a woman over thirty, when prolonged, should be viewed with suspicion. This appears in all text books, and is deserving of consideration; but in women, particularly, hoarseness may also be due to progressive atrophic rhinitis involving pharynx and larynx, or in washerwomen to a pachydermia laryngis, or in alcoholics and execessive tea drinkers to a similar mucosal thickening. In men, in addition to the causes enumerated, the hoarseness may appear in chemists, gas workers, smokers, public speakers, hawkers or in a number of vocational diseases which occasion thickening of the laryngeal mucosa. If every hoarse person, within the ages mentioned, were to be considered probable cancer cases we would be deluged with applicants either for radium treatment or laryngeal operations. Hoarseness only plays a part in those cases where inheritance is a factor and where other diagnostic symptoms concur therewith. *Immobility* of one cord is considered another diagnostic sign, but even here we

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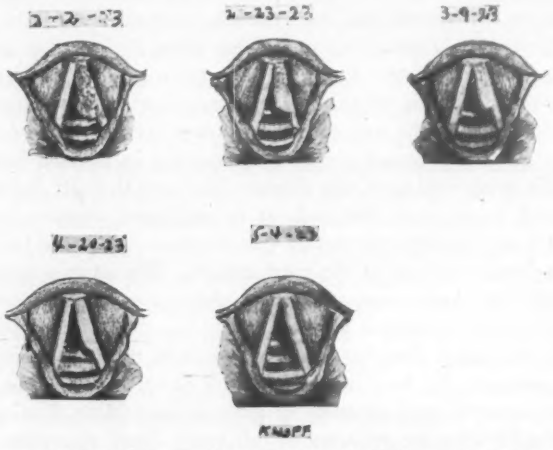
may have inhibted motion from a partial paralysis due to syphilis, to rheumatic ankylosis of the arytenoid joint, or to pressure upon the recurrent laryngeal nerve by mediastinal growths, enlarged thyroid or aneurism of the aorta or subclavian arteries. *Respiratory interference* is another specified symptom, but syphilis, tuberculosis, and benign tumors present the same symptoms, and frequently in a more exaggerated form than in cancer.

Location: Authors have stressed the location of the growth, stating that the posterior third of the cord is the predominating location for malignancy. This may be borne out in a series of a hundred cases, but the laryngologist of limited experience does not have the opportunity of observing a hundred cases of intrinsic can-



Carcinoma of left vocal cord. Treated with Radium. Patient—J. S.

cer of the larynx, and in his series the growths may all be located upon the middle or anterior third of the cord. A majority of the intrinsic cases of cancer I have seen in later years have been on the middle or anterior third of the cord. *Pain* is by no means a factor in this type of case, either locally, upon pressure over the larynx, or reflexly in the ear. *Foetor,* or any distinguishing odor, does not appear until ulceration and necrosis have taken place. What, then, may be enumerated as some of the aids to diagnosis of intrinsic cancer,

Subjective: Hoarseness in one of the specified age lasting over a period of three months without exacerbation, and in whom vocation can be excluded as a factor, is of unquestionable diagnostic

value. Slight hacking cough without adequate mucus evidence of existing bronchitis. Slight shortness of breath upon exertion in one without athmatic or tuberculous tendencies. Pain either locally or reflex plays no part, as it is almost always absent in incipient cancer.

Inheritance: Here again our diagnosis is fallible, for in the majority of cases there is no history of inheritance, or if so, the patient is not aware of the ancestral taint.

Objective Appearance: Situated upon the cord, or in some of the other locations designated as intrinsic, there may be a small, warty growth presenting a white granular or papillomatus extension projecting from an unusually vascular base. If situated upon the cord it will seem as though it is a part thereof and the blood supply and infiltration will extend into the ventricle or even to the false cord. The location is of small importance for there are as many appearing anteriorly as posteriorly which is verified by the experience of the writer and some of his co-workers. The cord on attempted phonation will, in the majority of instances, move with less rapidity and will not approach the median line; but in isolated instances even this immotility does not obtain. The growth itself instead of appearing to sit upon the cord, as in papilloma, appears to be a part of it and presents the picture that if removed it would be necessary to remove a part of the cord with it. The base is unusually supplied with blood vessels which not only appear on the cord but upon its under surface as well.

This description does not apply to cancer of the ventricular band or the ventricle, for here we have often a globular, red tumor without the outward early evidence of granulation. More fixation and greater infiltration are apparent in this type. Until ulceration takes place it is more difficult of diagnosis than cancer of the true cord. Positive diagnosis can only be made by exclusion and by a microscopical examination of a deeply removed specimen.

Diagnosis by Exclusion: Syphilis, tuberculosis and benign neoplasms are the conditions for exclusion. A Wassermann test should be made in every case, and although by no means infallible, it yet tends to exclude one element. Physical examination of the lungs and by X-ray tends to exclude the second element, for laryngeal tuberculosis is, in my experience, always secondary. To exclude benign neoplasms, nothing short of a microscopical examination of a properly removed section of the tumor will definitely determine its character.

Biopsy: Here I would emphasize my personal opinion in regard to biopsy. For definite conclusions of any value, it is necessary to

remove a piece of the tumor extending well into its basal structure, as many papillomatous masses grow from a basal malignancy. Second it is imperative that the microscopist should be acquainted with the examination of small bits of tissue removed from mucous membranes; otherwise, his deductions are apt to be misleading. Again the microscopist should be made acquainted with every detail concerning the case, as the age of the patient, the time of probable existence, the location of the piece removed, and all other data in the hands of the surgeon. When so fortified and he has presented his conclusions, it is reasonably safe for the surgeon to consider his next step from the report submitted. I do not believe that operative interference by either laryngo-fissure or total laryngectomy is justifiable without all of these available data. This conclusion is based upon experiences, some of which follow:

Some years ago, before the advent of the Wassermann test for syphilis, a man of prominence was brought to me by a distiguished laryngologist of Washington, D. C., with the request that I take the case in hand as he was going abroad to recuperate from a recent illness. The patient, according to this physician, had intrinsic cancer of one vocal cord. Syphilis had been excluded by anti-specific treatment, and no evidence of tuberculosis was obtainable. To be doubly secure I had two of New York's leading laryngologists and one internist see him in consultation. All excluded syphilis and tuberculosis, and all agreed with me and the Washington laryngologist that it was incipient intrinsic cancer. It was also agreed that laryngo-fissure was advisable. I performed the operation and the immediate result was satisfactory. However, the patient developed a lobar pneumonia within a week after the operation from which he died. The part of the larynx removed was submitted to one of our best microscopists, who pronounced it syphilis. I am still of the opinion, however, that the tumor was malignant.

Recently I was called in consultation with three other laryngologists to determine the nature of a laryngeal growth in a man of sixty who had been hoarse for six months and who was getting progressively worse. The tumor itself was progressing rapidly according to the specialist in charge. I advocated the removal of a piece for microscopical examination, as I was by no means sure that the growth was malignant. I was actuated in this belief by the fact that it did not appear sufficiently vascular nor did the cord and ventricular band seem sufficiently infiltrated for the size of the growth on the cord. However, a laryngo-fissure was performed and the growth proved microscopically to be a papilloma. The surgeons

in charge of the case were forced to do a laryngo-fissure as the patient was unwilling to submit to a biopsy for diagnosis with the possibility of a laryngo-fissure later. Three cases of cancer of the larynx are on record where the surgeons have removed the tumor with a snare by the indirect method and unintentionally. The histories of the cases of Ballinger and Thomson are recorded in their books, and I will now detail my own.

A woman, Mrs. R., age 45, married, with two grown children, came to me, May 12, 1916, complaining of hoarseness over a period of three years and of having suffered with dyspnea on exertion. She had no cough, but had had some pain locally. Examination showed a very large pedunculated tumor on the anterior third of the left cord and extending into the anterior commissure. From its location, appearance, and length of time of existence I concluded it was a fibro-papilloma and removed it under cocain anesthesia in my office by the indirect method. I sent the specimen to Drs. Ewing of Cornell and Eggston of the Manhattan for examination and was surprised to receive a report of basal celled carcinoma from each. I placed the matter of laryngo-fissure before the patient and strongly advised the operation but she emphatically turned it down. The growth returned and was again removed July 7, 1917, again in January, 1919, again in January, 1920, and again in September, 1920. Each time it returned it looked less malignant and had likewise changed its location although the microscopical reports were the same. In December, 1920, I sent her to Dr. Quick for radium. In September, 1921, all vestige of the growth had disappeared and the cords were movable and the voice was better than I had ever known it. But on October 11, 1921, she came in cyanosed, with loss of voice and with the larynx closed. An immediate tracheotomy was imperative. After wearing the tube for several months all swelling had subsided and only some granulations remained subglottically in the anterior commissure. I ultimately removed the tracheal tube and from time to time she has had radium applied with apparently beneficial effect. Now and then large masses of granulation tissue will spring up well below the cords and on the tracheal wall which she will cough up. Here is a case having been under observation for seven years in which each piece removed has shown unmistakable evidences of carcinoma, where the site of the original tumor is free from involvement, where the patient has not lost weight nor general health, and where no operative measures other than those performed by the indirect method have been instituted. What effect radium has had is still unanswered. If this case had had a laryngo-fissure or a total

laryngectomy it would have added one more to that ever growing number of reported successes. I might add that she is perfectly well, pursuing her daily duties and is continuing with the radium.

In connection with this case I wish to outline briefly the history of another case appearing recently upon my clinic at the Manhattan Eye, Ear and Throat Hospital, and which has been presented to the Section of Laryngology of the New York Academy of Medicine by my assistant, Dr. Knopf. A man, aged 72, weight 113 pounds, pale, thin and cadaveric; had been a letter carrier; no family nor previous history pertinent. Complained of hoarseness for eight weeks, which was progressive as was his failing general health. He had lost fifteen pounds, had some cough but no pain, slight aphonia, and some dyspnea. Examination of the larynx showed a large smooth pale growth about the size of a small bird's egg resting upon the false cord of the left side, but apparently springing from the anterior third of the left true cord. The growth was moderately vascular. Motility was diminished. He was admitted to the hospital for operation, but during the night a violent fit of coughing disengaged the large tumor which was diagnosed by the microscopist as a hemorrhagic polyp. There remained, however, a suspiciously involved cord, (as seen in the illustration) a section of which was taken for biopsy, and he was retained in the hospital for further operative consideration. A laryngo-fissure was at first thought to be the logical procedure. However, owing to his age and his debilitated condition, it was decided to refer him to the raidographer for treatment. The pathologist's report of a section removed from the cord read as follows: "Specimen consists of a nodular piece of tissue, section of which shows a thin surface of mucosa, which is necrotic and irregular in areas. In one area there are masses of epithelial cells surrounded by connective tissue. The stroma of the tumor is edematous and infiltrated with polynuclea leucocytes. Scattered thickly throughout the stroma there are large spindle and round cells with a few giant cells. Diagnosis: Basal celled epithelioma."

(Illustration showing progress of case with each application of radium.)

February 6, 1923, 70 mg. radium was applied externally in a block to the neck over the thyroid cartilage for 24 hours.

March 9, 1923, 50 mg. was again applied in the same region and in the same manner for 20 hours.

April 2, 1923, the radium needles consisting of 30 mg. were inserted directly into the mass by direct laryngoscopy and left in situ for 4 hours. There was no reaction following any of the applica-

tions. I saw him in my office on June 30th last. There appears now no evidence of involvement. His voice is normal. The cord is movable. He has gained in weight, and everything points to eradication. Another case where laryngo-fissure or laryngectomy might have been reported favorably.

TREATMENT.

After positive diagnosis has been made the greater question of treatment arises. In patients beyond sixty-five, operative interference is questionable.

Therapy: Radium retards, even if it does not eradicate, caner of the larynx. It does this by producing an endarteritis—shutting off the nutrition to the tumor; and before nourishment is re-established the patient may have gone a year or more. Even when circulation is re-established and fulmination of the growth appears, tracheotomy will often add still another period to the longevity of the patient; so that in cases of questionable operative risk it is advisable to employ radium. But if the cancer is recognized in its incipiency, in the early period of its probable occurrence, and in comparatively young people, laryngo-fissure is of unquestionable merit. So many of our most noted laryngologists, as Semon, Thomson, Jackson, Delevan and others, have presented such unquestionable evidence of its value, that it warrants the assumption that no more radical method should be immediately resorted to. To delay operation by employing radium, in these especially adaptable cases for laryngo-fissure, is to my mind, unjustifiable; yet many cases come under the supervision of the laryngologist who absolutely reject operative interference and insist upon radium treatment. The lay press and the reports of cases by laryngologists in which radium has been effective, have imbued the layman with an unjustifiable belief in its efficiency and no argument to the contrary will eliminate it.

Intra laryngeal removal by suspension, as practised and advocated by Lynch of New Orleans, is questionable except perhaps in the hands of one gifted as Lynch is in the employment of instruments within the larynx through a long tube and at a great distance from the operative hand. I would not for a moment question Lynch's reports, but would emphatically state that in my own hands the operation would be an unjustifiable procedure. It is entirely possible that those cases reported by Lynch may bear striking similarity to the case Thomson has reported as removed indirectly by error, as well as to the one I have just outlined in this paper.

There has not appeared, as yet, a microscopist able to determine from his slide the degree of malignancy of the specimen presented,

however certain he may be that it is malignant. It is also affrmed by reliable authorities that some forms of malignancy disappear spontaneously, and it may be not only this type of case but the slow malignant type which responds so adequately to the lesser operative procedures. This furnishes misleading statistics in favor of minor procedures.

Radium is still in its uncertain stage, although occasionally very favorable results follow its use. Whether it should be employed before or after operation to produce an endarteritis is still a mooted question. To rely upon it alone, in a case where age, location, temperament and general health justifies laryngo-fissure is unwarrantable.

The employment of fulgeration, galvano cautery or any of the many caustics is beyond question unjustifiable and the surgeon abandons, by their use, the crucial operative period for success.

Total laryngectomy for an incipient, intrinsic, laryngeal cancer is questionable, although Mackenty advocates laryngectomy in all cases. As he has had the best results from laryngectomy in a greater number of cases than any of our American confreres, his opinion should be deliberated upon with an unbiased mind. His operative technique and individual method, together with his unremitting after care has produced most astonishingly favorable results. I have seen a number of his post-operative laryngectomy cases, some of whom talk fairly well, most are happy, most have resumed their vocations, a great many have no necessity for wearing a tracheal tube due to his method of transfixing the skin into the tracheal wound, and upon the whole it appears a sane and safe procedure. In rebuttal of his argument in favor of total laryngectomy I shall relate the history of two cases both of whom were seen by him in consultation, which tend to lessen somewhat his very definite attitude towards laryngectomy.

1. Mr. H. P. G., of Trinidad, British West Indies, was referred to me June 12, 1913. He was a lawyer by profession and complained of hoarseness supposedly induced by a three hour argument seven months previously. He had been treated by a local physician with lactic acid, iodin, and inhalation of steam with various medicaments. His father had died of cancer of the tongue and larynx, but no further family or personal history bore upon the case. He was 45 years of age when first seen. Examination showed the left cord reddened and thickened throughout its extent—more pronounced anteriorly. There was slight loss of motion of the involved cord. I had Dr. Chappell, now deceased, see the case in consulta-

tion and he pronounced it cancer. Dr. Jonathan Wright also saw the case and thought with me that it was pachydermia laryngis. A complete rest of the voice was advised and the abandonment of his vocation. This was done. In 1920, seven years thereafter, he returned for a second examination. His voice in the meantime had remained normal for several years, and he had gained in weight and was otherwise healthy. There was now more fixation of the cord but otherwise there was little change. I then had him see Mackenty who advised laryngectomy. The question of laryngectomy was placed before the patient, but he absolutely refused to undergo the operation. I then had him see Dr. Quick who applied radium for several months, with apparent benefit and he was advised to return home to await further developments. His weight increased from 140 to 170 pounds and he felt well, but his voice did not improve, although there was not, nor has there ever been, any pain or discomfort. In January, 1923, he felt that another series of radium treatments might be beneficial, and I saw him for the third time in May—ten years after the first visit. Examination showed a fixed left cord and an immovable arytenoid. There was some ulceration both anteriorly and posteriorly. He is now receiving his second series of radium treatments, and while both Dr. Wright and myself were probably wrong in our diagnosis, yet this man tends to "carry on" through the best part of his allotted existence without operative interference, and there is just a possibility that it is not cancer at all, as no specimen has ever been removed to establish absolutely its character. Syphilis and tuberculosis have been excluded.

2. Dr. J. T., age 55, of Bogota, Colombia, South America, was sent to me December 22, 1919. He had been hoarse for two years which was progressively increasing. There was no pain either on speaking or swallowing. Examination showed the epiglottis to be immovable and streaked with blood vessels. The arytenoids and interarytenoid space was infiltrated and thickened. The right vocal cord appeared leukoplakial and slow in movement. Tuberculosis and syphilis were negative.

I sent the patient to Mackenty, December 30, 1919, for consultation. His diagnosis was epithelioma of larynx and he advised laryngectomy. In this advice I fully concurred, but the patient had come to New York with the definite intent of having radium applied and I could only acquiesce in his determination. He was sent to Dr. H. H. Janeway, now deceased, who made a number of radium applications. Extensive edema resulted, but it all ultimately

subsided, and the patient departed in six months materially benefited, so far as observation could determine. He was to have returned in a year's time if not satisfied. As he did not return, and as I have heard indirectly, that he was satisfied with the results, I conclude that it was only a leukoplakia, resulting from his inveterate use of tobacco upon which radium has a beneficent influence.

There are cases of leukoplakia—which represents the lowest order of malignancy—which will continue for years, even without treatment, before becoming sufficiently advanced to justify operative interference. In these cases I believe radium to be of intestimable value. I reported such a case a number of years ago where the patient had gone for thirteen years after the first diagnosis made by the late Dr. Gleitsman before he came under my observation. He then went another year before it became imperative to do a tracheotomy, after which he consented to a laryngectomy. Dr. George Brewer removed his larynx and the specimen showed extensive involvement even down to the cricoid cartilage. The patient was kept under observation for two years following the operation without any evidence of recurrence, but ultimately drifted into the ranks of the unapproachable and further observation was futile.

CONCLUSIONS.

If deductions can be made from the foregoing expressions they would lead us to conclude:

1st: That favorable statistics are often presented where operations have been performed upon cases which show macroscopically a slow or relatively slowly progressive evidence of malignancy, which statistics are misleading in the majority of cases.

2nd: That methods of operative procedure should vary with the deftness and technique of the operator.

3rd: That positive diagnosis of cancer from biopsy does not always precede the operation, and the omission can lead to grievous error, and misleading deductions.

4th: That laryngologists, with the best and most earnest intentions, vary in regard to their method of procedure in laryngeal cancer.

5th: That some cases recover spontaneously, that others recover from intra-laryngeal operations either by the direct or indirect method and that others respond to the administration of radium, all of which materially affects the deductions to be drawn from the results reported by our specialty.

44 West 49th Street.

INDICATIONS FOR RADICAL MASTOID OPERATION.*

DR. JAMES MORRISSET SMITH, New York.

The chronic discharging ear has had a very stormy voyage through the realms of medicine and surgery. For many years it was considered proper so long as the ear continued to discharge, concern was shown only in the event that the discharge materially lessened or stopped. Some of them died of brain fever (in reality meningitis), but that was considered unavoidable.

In the latter years, following the perfection of the simple mastoid operation, various modifications were advocated for the relief of chronic discharging ears, and finally the radical operation was devised.

The peculiarly intricate anatomical structure of the temporal bone, together with its intimate relation with the facial nerve, brain and meninges, makes this operation a very difficult one.

The results in the beginning were far from satisfactory. There were many injuries to the facial nerve as well as quite a few intra-cranial complications. This combination of circumstances caused the operation to be looked upon with considerable disfavor, some of the otologists going so far as to state that it shuld never be attempted. The results now are entirely satisfactory, and when poor, can be directly attributed to inexperience or faulty technique.

The chronic discharging ear represents an infection and does not differ materially from an infection in any other part of the body. Some are operative and some are not. To state that operation is never indicated would be equivalent to saying that an infected leg, gall bladder or appendix never require surgical intervention.

An ear that shows a continuous foul smelling discharge, persisting in spite of local treatment, indicates a necrosis of the tissues within the temporal bone. Realizing that this bone lies in the angle between the cerebrum and cerebellum, together with the labyrinth, meninges and other intra-cranial structures, it can readily be seen why an extensive necrosis may become dangerous to life itself.

It must be determined when this destruction reaches or passes the danger point. In some instances, the problem becomes a most difficult one.

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*Read before the Section on Otology, New York Academy of Medicine, November 9, 1923.
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An old ear that suddenly flares up with a high temperature, headache, meningeal or other symptoms of intra-cranial extension of infection hardly requires an expert to determine that operation is necessary. Another case may have gone for years with nothing but a slight discharge to indicate the presence of an impending meningitis.

Opinions on a number of old discharging ears are very apt to differ so that rather than attempt to formulate a definite set of indications, this article will consist of a discussion of the different phases of chronic aural infections, with a view to helping decide what is indicated in the individual case.

In order to facilitate the discussion, they will be divided into three classes, remembering that there are no distinct dividing lines between them, and that one may readily be converted into the other. They are as follows:

Class 1—Chronic discharging ears in which operation is not indicated.

Class 2—Cases demanding immediate operation.

Class 3—Doubtful cases.

CLASS 1. CHRONIC DISCHARGING EARS WHICH OPERATION IS NOT INDICATED.

Generally speaking, this type lacks the essential evidence of bone destruction. They might well be termed mucous membrane infections. The discharge is largely due to an infection of the mucous membrane of the middle ear and Eustachian tube. It is mucoid in character. The foul odor indicative of bone necrosis is missing. Physical examination shows a clean-cut perforation or destruction of the drum membrane. The mucous membrane of the middle ear is free from granulations and polypi. After the discharge is removed, it usually has a red healthy appearance. The tympanic probe discloses little if any evidence of bare bone. The hearing is unusually good. There is nothing to indicate bony destruction in the attic, antrum or mastoid. The discharge is frequently intermittent, recurring with each acute naso-pharyngitis. It is entirely possible at any time to have a reinfection with a conversion into Class Two or Class Three, but unless this occurs, the writer can see no reason why a mastoid operation should be advised in the above class of infections.

CLASS 2. CASES DEMANDING IMMEDIATE OPERATION.

Here there are symptoms which experience has taught demand immediate exploration, or there is concrete evidence of an intracranial extension of the infection. Included under this heading are

cholesteatoma, facial paralysis, subperiosteal abscess, acute exacerbation of chronic ears, sagging canal wall, and an evidence of an intra-cranial complication. The large aural clinic will show each year cases of thrombosis of the lateral sinus brain abscess, labyrinthitis or meningitis due directly to neglect of an old discharging ear. The writer reports one hundred and four mastoid operations performed at the New York Polyclinic Hospital with three deaths.[1] All three were due to neglected chronic ears, the infection having extended beyond the mastoid before operation. One was a lateral sinus thrombosis followed by double cavernous sinus thrombosis, one a cerebral and the other a cerebellar abscess. A very deplorable fact is that many of these cases have been to a number of different ear clinics with nothing other than irrigations and alcohol drops advised to arrest the condition.

A cholesteatoma if allowed to remain undisturbed, slowly but surely enlarges, destroying the bone as well as the soft tissues, and will almost invariably result in an intra-cranial complication. Its presence alone indicates operation.

Facial paralysis may be the first warning of the extensive destruction and demands immediate operation. Careful removal of the diseased bone is usually followed by complete restoration of function.

A subperiosteal abscess indicates a cortical perforation due to either a cholesteatoma or extensive necrosis. An acute exacerbation of a chronic infection is particularly apt to be dangerous and means an additional infection added to the old one or a distinct warning of an extension of the infection beyond the mastoid. Prompt exploration may limit or prevent an ensuing meningitis. A definite sagging of the upper and inner canal wall demands immediate exploration. It is not so common as in the acute infections and is generally due to a cholesteatoma.

A high temperature, intense headache, nausea, vomiting, nystagmus, dizziness, stiff neck, occurring separately or collectively as a result of an old diseased ear, warrant an immediate exploration, remembering the importance of a spinal fluid analysis in all cases of meningeal involvement. A negative culture from the spinal fluid means there is still a chance for recovery.

The writer just had a man with a labyrinthitis and beginning meningitis recover following a labyrinth operation in which was a cloudy spinal fluid with a cell count of 18,100 per cu. m. m. The culture from the fluid was negative.

Evidence of a labyrinthian infection demands a radical operation but may or may not require a labyrinth operation.[2] Unfortunately

we are still helpless in the presence of a diffuse meningitis. Nature however generally gives warning of the spreading infection. For this reason, immediate exploration is advocated in all cases in Class Two with the hope of preventing a fatal intra-cranial complication.

CLASS 3. DOUBTFUL CASES.

The doubtful cases have been purposely placed last. They include the old discharging ear with few, if any, symptoms. An intimate knowledge of otitic infections is necessary to pass on a number of such cases. One may have discharged several years and be free from danger, another may be of equal duration and be very dangerous. There are a number of different factors to be considered here since any combination of them may enter the individual case. They will each be given a brief consideration. They are as follows:

History.
Hearing.
Temperature, Pain, Tenderness.
Presence of Polypi or Granulations.
X-ray examination.
Bacteriological examination.
Physical examination of the ear.
Character of discharge.

History: In order that the deeper structures of the mastoid become involved, it is necessary for the infection to be a severe one, or that the resistance be materially lowered by some concurring infection. For this reason, nearly all of the old ears follow one of the severe infectious diseases. The three chief offenders are scarlet fever, diphtheria and measles with pneumonia, influenza and other infections also playing a part. Scarlet fever probably leads the list. Very frequently cases are seen in adult life with a discharging ear dating back to an attack of scarlet fever in infancy. They are especially apt to be dangerous.

Hearing: In a large majority, the depreciation is due to disturbed conduction, the nerve and inner ear are not involved. The hearing is lowered first by the perforation or destruction of the drum membrane, next by necrosis of the ossicular chain, then by the mechanical obstruction due to the granulation tissue. Operation upon a chronic ear is advised as a rule on account of the existing danger. However, it is true that the average case requiring a radical operation should have improved hearing after the operation. Dr. Dench called attention to this fact some time back. The

writer presented ten post-operative radicals before the Otological Section, with improved hearing in eight of the ten cases.[3]

This result will be obtained only where a very complete radical is done and the skin allowed to grow over the internal wall of the middle ear without granulation tissue. The sounds are then conveyed directly to the inner ear. We may see a dangerous necrosis present with very little granulation tissue and good hearing. With an involvement of the nerve or inner ear, needless to say little, if any, improvement in the hearing can be expected unless it is a serous or circumbscribed labyrinthitis.

Presence of Polypi or Granulations: Does this indicate operation? It is well known that granulations may form very quickly from a small break in the mucous membrane and we have all doubtless had dry ears quickly follow their removal. It would then depend on their origin. If they are recent and coming from a small break in the mucous membrane, especially in the middle ear, a simple removal followed by local treatment will result in a dry ear. If it is long standing and coming from an extensive bone necrosis, a recurrence takes place very quickly and operation is usually necessary.

The question of polyp removal being followed by labyrinthian or meningeal symptoms, comes up at this point. Where this occurs, there is dangerous necrosis already present and the removal is certainly not contra-indicated. It should be noted that a radical operation was indicated in the first place. All cases should be kept under close observation following the polyp removal and should any unfavorable symptoms result, immediate surgical relief is indicated.

Temperature, Pain, Tenderness: These symptoms ordinarily do not occur with an old ear. Their presence individually or collectively demand immediate investigation. A high temperature due to a chronic ear means either an acute infection added to an old one, or a beginning intra-cranial complication. Pain is usually absent and if marked, is apt to mean an involvement of the dura labyrinth or brain. We may have headaches from an ear that is packed with dense granulations. Intense headache accompanied by insomnia are suggestive of brain abscess especially in the cerebellar fossa. Tenderness is absent unless there should be a cortical perforation following a cholesteatoma or extensive destruction of bone. Generally speaking, the occurrence of the above symptoms would indicate the conversion of the case into Class Three with immediate exploration indicated.

Value of X-ray: The X-ray is not nearly so helpful here as it is in the acute case. The chronic inflammation causes the mastoid cells to be replaced with hard sclerosed bone, the picture resulting in a dense shadow. It may be of service where there is an extensive bony destruction on a large cholesteatoma present.

Bacteriological Examination: Very little help may be expected here. Both smear and culture show a number of mixed germs and a predominating organism such as a pneumococcus or sereptococcus, are found only where there is an acute exacerbation present. Occasionally enough evidence may be found in the smear to make a diagnosis of cholesteatoma.

Physical Examination of the Ear: After having examined a large number of chronic ears, one instinctively knows whether or not there is an extensive bony destruction in a given case, yet the complex is not at all easy to describe. Where there is an extensive bone destruction, the picture is just the reverse of the one described in the mucus infections. Instead of the clean-cut perforation with the mucoid discharge, there is a ragged marginal or complete destruction of the drum. The tympanum contains numerous granulations. There is a partial or complete necrosis of the ossicular chain. The hearing shows depreciation. There is usually a distinct fistulous tract leading upward to the attic and backward to the mastoid. The tympanic probe discloses bare bone. The discharge is dirty, purulent, very foul smelling and unchanged by local treatment. The picture as a whole is one of bone destruction.

One type particularly insiduous and dangerous is very ably described by Dr. Whitling. The perforation is usually small and high up, leading into the attic. The discharge is a dirty, grayish color, scant and foul smelling. Granulation are not numerous and the hearing usually is good. The necrosis is usually deep seated and inaccessible. Owing to the lack of symptoms and scant discharge, it is apt to be overlooked.

Character of the Discharge: In the absence of symptoms and a negative or non-productive physical examination, the decision rests largely on the type of discharge and its reaction to careful local treatment. Where the bone involvement is not deep seated or extensive, the reaction to local treatment is favorable. The foul odor disappears and the discharge becomes mucoid or stops entirely. A continued foul smelling purulent discharge persisting in spite of careful local treatment indicates destruction of bone.

The necrosis is situated in the attic antrum or mastoid. These areas are very inaccessible and explain the failure of local appli-

cations and treatments through the external auditory canal. With persistent evidence of bone destruction present, a careful operation is safer than an attempt to forecast the probable course of the infection in the future.

While this article deals with the indications for operation, the question naturally arises as to what results can be expected from the radical operation. With the proper technique, they are excellent. There is either a dry ear or slight mucoid discharge from the tube with the danger entirely eliminated.

The argument has been advanced that some of the ears continue to discharge following a radical operation, so why operate? The operation is advised to remove a dangerous necrosis of the bone adjacent to the meninges in the middle and posterior fossa. With the proper technique, this is accomplished. Any remaining discharge is due to failure to permanently close the Eustachian tube. The discharge is mucoid and while annoying, it is not dangerous.

If after advising a radical operation, the operator finds upon opening the bone that the necrosis is less extensive than was first supposed, and especially if the ossicles seem to be intact, a radical operation may be avoided by doing a very complete simple mastoid with a wide opening in the attic, carefully removing the granulations, allowing the ossicles to remain undisturbed, then removing the granulations or polyps from the middle ear through the external auditory canal. A radical may be performed later in the event that this is not successful.

The radical operation is primarily indicated in the presence of an extensive and dangerous necrosis and where the proper indications and technique are followed, the results will be very gratifying.

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2. Labyrinthean Surgery, *New York Medical Journal and Medical Record*, July 19, 1923.

3. Report of ten Radical Mastoid Operations with Post-Operative Hearing and Results, THE LARYNGOSCOPE, August, 1918.

25 West 51st Street.

IMPROVING THE GUILLOTINE TONSIL OPERATION.

Dr. Thomas E. Walker, Cleveland, Ohio.

The accompanying drawings illustrate a device which is an attachment for the guillotine tonsil instrument. The purpose is to form a receptacle into which the tonsil and the contents of the tonsil are collected. Particularly the contents, which otherwise would be free in the breathing passage.

The illustration is for the author's hemostatic instrument as described in "The Laryngoscope", December, 1921. It consists of a steel frame (B), shaped like the window of the instrument and having a projection extending along the under surface of the window bar (A), attached by a machine screw in the bar fitting into a slot in the frame projection. Over the window opening in the frame is stretched a portion of the finger of a rubber glove. The attachment may be fitted to any type of fenestrated instrument, if made for the particular instrument, by a mechanic or by the maker of the instrument. The instrument, however, must be so constructed that it completely severs the tonsil from its attachment without the use of any other instrument, as the rubber bag prevents manipulation of the tonsil.

One of the sequela, though this is uncommon, of the tonsil operation is the lung abscess. This is caused, not so much by the action of the anesthetic, as by the aspirating of septic fluid and particles of septic material expressed from the tonsil into the respiratory passage.

Swab cultures from the surface of the tonsil show flora of numerous organisms, many of which are pathogenic. In a series of more than a thousand cases, done at Charity Hospital, by Dr. McNeeley, myself and associates, in 1919 and 1920, it was found that many organisms inhabit the tonsil. The result of the tests in this series was inconclusive, in-as-much as the cases which developed complications, did not show in the bacteriological examination that these would follow. Since the surface of the tonsil shows presence of organisms, it is probable that the crypts also contain them, but in more virulent forms.

As the contents of the crypts are inspired, lodging in the bronchi and alveoli, the mucous membrane of which does not

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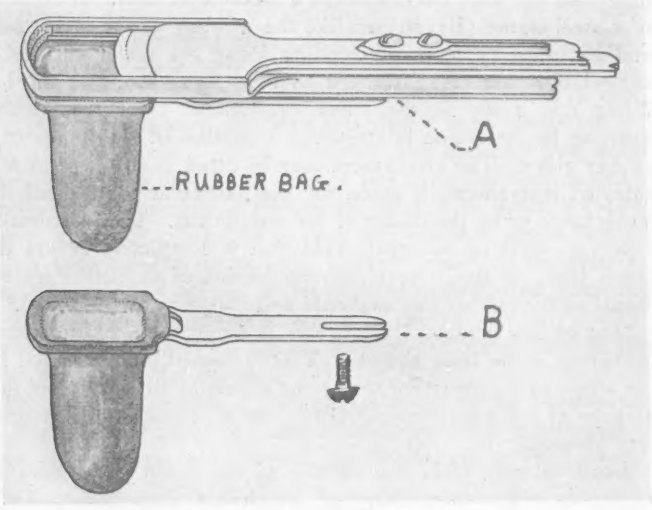
tolerate the particular organism well, it is reasonable to assume that an infection may occur which can develop into an abscess. Therefore if the expressed contents are kept out of the respiratory passage, one of the important factors causing lung abscess, is obviated.

The amount of the tonsilar content is amazing and can be seen if collected. In using the device described, after the removal of one tonsil, if the instrument is washed in a glass of warm water, the debris settles to the bottom forming a layer. In many cases this layer is an eighth of an inch in thickness over the bottom of the glass. Observation of this impressed up-



on the author the necessity of keeping the tonsilar content out of the respiratory passage.

The first experiments to accomplish this were in using a metal box, similar to the LaForce adenotome box, but this was unwieldy and in the way. A soft bag, such as the finger of a glove was found to be practical and ideal.

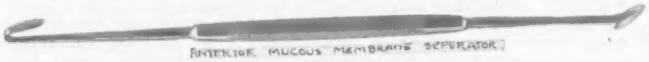
This description and report is based upon the use of the device, during the past eight months, in the clinic of Lakeside Hospital and in private practice, in about three hundred cases.

6500 Detroit Avenue.

A MODIFICATION OF THE BALLENGER SWIVEL KNIFE AND ANTERIOR MUCOUS MEMBRANE SEPARATOR.

Dr. A. J. Shekter, Jamaica, L. I.

Every now and then one runs up against a case where it becomes necessary to dissect out a piece of cartilage anterior to the initial incision. Whether this becomes necessary because the initial incision was made too far back or because of peculiar deflection or dislocation, the fact remains that we do meet with just such cases.



These two instruments were devised to meet such conditions. The Anterior Mucous Membrane Separator will separate the mucous membrane anteriorly to the initial line of incision and the modified swivel knife will cut from behind forward. I'm sure these two instruments will prove valuable to the nose and throat specialist.

150-01 88th Ave.

Editor's Note—This manuscript received in The Laryngoscope Office and accepted for publication, November 26, 1923.

A BIBLIOGRAPHICAL OVERSIGHT.

In the February (last) issue of The Laryngoscope, I published an observation on the "Use of Radium for Nasal Polyps", believing it to have been the primary observation.

I was wrong.

Dr. H. R. Lyons has been good enough to write to me telling of his observation to the same purpose. It was published in the *American Journal of Roentgenology*, 9:584-587-September, 1922.

It is, therefore, with much pleasure that I acknowledge and record Dr. Lyons' observation. I am, however, glad that it has been my fortune to confirm Dr. Lyons' conclusions.

Greenfield Sluder.

BOOK REVIEWS.

Hygiene of the Voice by Irving Wilson Voorhees, M.S. (Princeton); M.D. (Columbia). Fellow of the New York Academy of Medicine; Member of the American Academy of Ophthalmology and Oto-Laryngology; Fellow of the American Laryngological, Rhinological and Otological Society; Assistant Surgeon to the Manhattan Eye. Ear and Throat Hospital; Consultant to the Tarrytown and to the Rockaway Beach Hospitals; Adviser to Singers of the Metropolitan, Chicago and Century Opera Companies, etc. The MacMillan Company, New York, 1923. Price, $2.50.

Designed as it is for the instruction of two groups of individuals, singers and singing teachers, and voice physicians, this little volume is a very distinct addition to laryngological literature.

The first part is devoted to a discussion of the singer and the problems of voice production and voice protection. A lot of very valuable information regarding the physiology of voice production, vocal habits which handicap the singer, colds and their cause and cure and other allied subjects is given in this section.

Part Two is written for the laryngologist and presents the problem of the care and treatment of the singer's nose and throat from a somewhat different standpoint than usual. The psychology of the singer, the peculiar voice problems of the artist, the tonsil question, to remove or not to remove are all admirably presented. There is no doubt that the average laryngologist rarely, if ever, quite understands the viewpoint of the singer on these questions and a careful perusal of these pages should make us much more tolerant of the whims of the vocal artist whose voice is his or her principal asset.

The material has been carefully selected and is admirably presented and a copy of this little book would be a valuable addition to the library of every singer, voice teacher and laryngologist.

Intranasal Surgery. By Fred J. Pratt, M.D., F.A.C.S. Assistant Professor, Eye, Ear, Nose and Throat, Medical School, University of Minnesota; and John A. Pratt, M.D., F. A. C. S. Assistant Professor, Eye, Ear Nose and Throat, Medical School, University of Minnesota. Minneapolis. F. A. Davis Company, Publishers, Philadelphia, 1924. Price, $5.00 net.

This book as the title indicates is an account of certain operations performed inside the nasal cavities and the authors confine their discussion strictly to these limits. The first five chapters are devoted to a description of the anatomy of the parts to be dealt with and a brief discussion of some of the pathological conditions which give cause for intranasal surgery.

A very splendid and detailed discussion of the technique of the submucous operation on the septum then follows. This includes several original details which have been devised by the authors, the method of saving a piece of cartilage in front and doing a complete operation behind is one new addition that certainly would be valuable in certain selected cases.

The remaining chapters are devoted to the intranasal operations on the various portions of the nose and nasal accessory cavities. No effort is made to discuss the relative merits of various operations devised to accomplish the same end, but a typical operation is selected for each purpose and described in detail.

Throughout, the discussion is illustrated by well chosen plates which add much to the clarity of the presentation.

This book should appeal at once to the man who though not a specialist may be occasionally called upon to perform these operations, and, as such, has our sincere commendation.

THE NEW YORK ACADEMY OF MEDICINE.

ANNIVERSARY OF FOUNDING OF N. U. LARYNGOLOGICAL SOCIETY.

Celebration of the Fiftieth Anniversary of the Founding of The New York Laryngological Society, now the Section of Laryngology of the Academy and the oldest Society of Laryngology in existence.

NEW YORK—The Birthplace of Laryngology.

HORACE GREEN—The Father of Laryngology. Discoverer of the law of the tolerance of the larynx to the presence of a foreign body. Introduced the topical treatment of the larynx and trachea. First in America to apply the laryngoscope to the uses of medical practice.

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CLINTON WAGNER—Founder of the New York Laryngological Society. Founder of the Metropolitan Throat Hospital.

FRANCKE HUNTINGTON BOSWORTH—First to appreciate the importance of the Nasal region and to suggest means for the relief of nasal obstruction.

WILLIAM CHAPMAN JARVIS—Ingenious contributor to the advancement of Rhinology.

GEORGE MOREWOOD LEFFERTS—Peerlees instructor: he perfected instruction in his art.

JOSEPH O'DWYER—Discoverer of the law of the tolerance of the larynx to the continued presence of a foreign body. Perfector of incubation. The Father of Bronchoscopy.

JOHN ORLANDOE ROE—The Father of Intranasal Reparative Surgery.

THOMAS RUSHMORE FRENCH—Discoverer of the Structure and Significance of the Intratonsillar Nodules. Inventor of the Tonsilloscope. Perfector of Laryngeal Photography.

THOMAS A. EDISON—Father of Light.

JONATHAN WRIGHT—Pathologist and Historian.

CARL KOLLER—Discoverer of Local Anesthesia.

ROBERT ABBE—Discoverer of the Efficiency of the Intralaryngeal Application of Radium for the Permanent cure of papilloma.

CATALOGUE OF EXHIBITION CASES.

Case A—Original operating set (tonsils) of Horace Green, 1845. Buck's Laryngeal Scarificators. Made for Dr. Buck by Tiemann, New York—1846 (presented by his son, the late Dr. Francis D. Buck).

Original Laryngoscope of Czermak of Budapest, who, following the suggestion of Manuel Garcia, adapted the laryngoscope to medical practice in 1858. (Unique and very fine specimen.)

Buck's tracheal lancet, for rapid tracheotomy.

Case B—Panel 1. Pre-laryngoscopic instruments introduced in 1845 by Horace Green for the topical treatment of the throat. Sponge probangs—laryngeal brushes.

Porte Caustique.

Panel 2. Powder blowers, including Lefferts, formerly in common use. Improved models of Clinton Wagner, 1875. Modern models—1923.

Panel 3. The Evolution of the Spray Tube Syringes for spraying the pharynx, larynx and trachea, as suggested by Horace Green, 1861. Spray tube at Fluhrer, 18—.

Spray tubes of Sass.

Spray tubes of latest models.

Panel 4. The Evolution of the Genius of O'Dwyer.

Instruments of Jos. O'Dwyer. Complete set made under the personal direction of Dr. O'Dwyer by (his special instrument maker) Geo. Ermold, of New York, showing the steps in the evolution of the intubation tube, from first to last, and including the special tubes for ordinary intubation, for the dilatation of chronic stenosis and for the expulsion of foreign bodies from the trachea.

Panel 5. Tubes of Dr. John Rogers, for dilating chronic laryngeal stricture.

Rogers fixation attachment, for preventing coughing out of tube. Tube retained in larynx without removal for more than 2½ years.

Specimens of the modification of Henry Lowndes Lynch of New York for the dilatation of deep stricture of the trachea have not been obtainable. His method is the most perfect yet devised.

Panel 6. Tubes of large caliber and thin wall, to facilitate the expulsion of foreign bodies from the trachea and bronchi, the prototype of the bronchoscope.

The Edison light.

The Bronchoscope.

Case C—Perfected Camera for instantaneous photography of the larynx.

Two albums showing method of photographing larynx.

Collection of photographs showing normal and pathological conditions and the physiological action of the larynx in the production of tone.

Tonsilloscope and microscope, with chart.

Lingual scraper, with chart.

Tonsillotome for removal of tonsil and of intratonsillar nodule—with chart.

Thomas Rushmore French.

Autograph letter of Manuel Garcia.

Hays Pharyngoscope.

Case D—Tonsil bistouries more than a century old.

Stevens tonsil ecraseur—1817.

Panel 1. Collection of tonsillotomies, from the earliest to the present, including fine specimens of physics, Fahnstock's and other primitive models. Also tongue depressors, caustic applicators, mouth gags, turn-keys, etc.

Panel 2. The evolution of the septal operation, including the saws of Bosworth and his followers, electric drills and trephines, septal pins, punches, forceps and splints, Asch's septal instruments, and the very early instruments of Roe and Mayer for submucous resection.

Panel 3. Complete collection of pioneer instruments contributed to the surgery of the nose by Jarvis.

Panel 4. Evolution of the Stethoscope from ancient forms to that of Cammann, of New York.

SCREENS.

E—The New York Laryngological Society.

F—The Section of Laryngology and Rhinology of the New York Academy of Medicine.

G—Teaching equipment of the Lefferts' system of instruction, College of Physicians and Surgeons, N. Y.

H—Photography of the larynx perfected by Dr. Thomas Rushmore French. Lithographic reproductions, Edited by Prof. E. J. Moure of Bordeaux, France.

J—National Laryngological Societies.

K—Early Laryngologists of United States.

L—Great Teachers of Laryngology.

SECTION OF RHINOLOGY AND LARYNGOLOGY.

STATED MEETING, *November 15, 1923.*

Address: The Birthplace of Laryngological Science. D. Bryson Delavan.

ILLUSTRATIONS AND SLIDES.

DR. A. B. DUEL, Vice-President of the Academy: Ladies and Gentlemen: In the absence of our President, the honor has devolved upon me to preside at this Fiftieth Anniversary Meeeting of the New York Laryngological Society. And it is a great honor, since it marks a milestone of great advancement in this branch of medicine, which has been heralded by a most appropriate programme and a remarkable exhibition. In introducing to you the speakers of the evening I trust you will bear with me for a moment while I ramblingly contrast in the briefest possible way the present conditions of our work with those of the men who fifty years ago founded the Society which long since became the laryngological Section of this Academy.

Compared with us, the men of those days groped about in utter darkness. In their examinations of the respiratory tract they were forced to depend upon a delicately trained tactile sense and a fine sense of hearing for differentiation of adventitious sounds conveyed through the stethoscope, for the information which we now acquire by direct illumination by means of brilliant electric lights through the laryngoscope, the bronchoscope, the naso-pharyngoscope, etc., supplemented frequently by skiagraphs which actually show us the slightest pathological changes of lungs, trachea, larynx, or nasal accessory sinuses.

They made their diagnoses or applied their remedial measures without the aid of anesthesia, either general or local. We should hardly think of attempting anything nowadays without an anesthetic.

They had no laboratory aids for either diagnosis or treatment; no bacterial investigations; no blood examinations; no vaccines; no antitoxins. Where should we be without these!

These men, however, without any literature to guide them; without skilled counsel to lean upon; without laboratory help to aid in diagnosis; with none of the elaborate paraphernalia in either hospital or office equipment, acquired a sense of touch, sight, and hearing which one seldom sees in these days. They developed an independence of spirit, a high degree of personal responsibility; and from these qualities, so highly developed, there came one after another these stepping stones in equipment, in technique, both in diagnosis and treatment, which mark our present high state of advancement and which we shall hear about in the papers of the evening and see in the exhibition which has been so carefully arranged.

We are much indebted to these notable men all along the line. It is well that we should remember this. It is well that we should pay tribute to them.

I take pleasure in presenting to you Dr. H. H. Forbes, the Chairman of the Section, who will make some preliminary remarks, after which Dr. D. Bryson Delavan, the guiding spirit of this historical gathering, through whose untiring energy and meticulous care this fascinating and highly instructive exhibition of laryngological instruments has been collected, will address us on the topic, "New York, the Birthplace of Laryngology".

DR. H. H. FORBES: Mr. President, Dr. Bosworth, Mrs. Wagner, Members of the Section of Laryngology of the New York Academy of Medicine, and Ladies and Gentlemen: As Chairman of the Section for this year, it will be with most pleasing remembrances that I shall look back in future years to my association with the members of the Section who have been most active in arranging for this celebration, and especially to Dr. Delavan to whom we are indebted for the conception of the plan and the scope of the meeting. The Section feels deeply the honor of the presence of the Acting President of the Academy. Telegrams of

congratulations have been received from the Section of Otology and Laryngology of the College of Physicians and Surgeons of Philadelphia, from the American Laryngological Association, and from the Section on Laryngology of the Royal Society of Medicine of Great Britain.

With the coming of the present autumn, the New York Laryngological Society will have existed for half a century. Fifty years ago a group of young physicians, recently graduated in medicine and more lately returned from their studies abroad, met together for the purpose of forming a society for the advancement of the new science of laryngology. They realized the importance of co-operation and of the interchange of ideas in the further pursuit of their studies, and they also recognized the great possibilities of growth which were presented by the infant specialty. They had never heard of the existence elsewhere of such a society, for the good reason that none had existed. There were ophthalmological societies and surgical societies, societies of otology, and of certain other specialities, but there was no society of laryngology anywhere in the world. So very quietly and modestly they formed one, and they called it the Laryngological Society of New York.

Their action in thus seeking to establish the specialty in this city upon a dignified basis was particularly wise and opportune. New York had universally been conceded to be the birth-place of laryngology. The discoveries and inventions of Horace Green and Gurdon Buck had laid the foundations of the new science, and in the dozen years which had elapsed between their work and the invention of Manuel Garcia constant efforts had been made to advance it. These were finally crowned by the invention of the laryngoscope. This bringing light out of darkness opened the way for the great results which followed and which cannot be properly appreciated without a comparison of the early day knowledge and methods with the highly advanced conditions of the present time.

The object of this meeting is two-fold: First, to celebrate what has proved to be an important event in the history of laryngology; and, second, to place before you as clearly as possible the splendid contributions made to laryngology by the medical profession of New York. Before the speaker of the evening tells you of the position of the Society in 1873, allow me to call your attention to the splendid development it has attained today.

We have many hospitals devoted to our specialty, as well as departments in the general hospitals. Twenty-one states have special hospitals. Under-graduate teaching is a part of the curriculum of all under-graduate medical schools, and twenty states have post-graduate institutions where the greater part of our advanced teaching takes place. The journals are many; while many societies have been formed since the inauguration of the New York Laryngological Society we are quite strong in the feeling that we are the parent and they the offspring.

The time allotted to the Chairman does not allow of my going more into detail, but I do wish to emphasize the efforts that are being made in New York and the United States at the present time for post-graduate teaching. In the exhibition, which is in the greater part due to the efforts of Dr. Delavan, we have represented the original writings and inventions of the laryngologists of New York. In the address to which you are about to listen, I am told that an attempt will be made to explain the origin of the specialty and to follow the progress of its splendid growth. No place could be more appropriate than this for such an address, since our city saw the birth of laryngology and has contributed to it many of its most important features.

DR. T. J. HARRIS then presented the Academy with a portrait of Professor Ludwig Turck.

DR. HARRIS: Mr. President, Ladies and Gentlemen: In the year 1905, in the city of London, there was held a notable celebration at which this Section was represented by one of its delegates who is here tonight, commemorative of the one hundredth anniversary of the birth of Manuel Garcia, to whom reference has been made this evening. Manuel Garcia

was distinguished not only for having attained this venerable age but also as having been the inventor of the laryngoscope. His interest in the laryngoscope was that of a teacher of the voice only. It remained for another to apply his invention to the study of diseases of the larynx, Dr. Ludwig Turck, an Austrian, who two years after 1857, after Garcia reported his observations on the human voice, stated that half by accident and quite ignorant of his predecessor's work, it occurred to him to make use of a small mirror to examine the larynx. Turck's contributions to the pathology of the larynx were numerous, so that his right to be regarded as the father of laryngoscopy is not to be disputed, resting on no less authority than our own Jonathan Wright, who says: "Whatever may be the claims of Turck to being the inventor of the laryngoscope he was first in spreading the knowledge of diseases of the larynx by its use." Turck was the predecessor of Schroetter and others as Professor of Laryngoscopy in Vienna. It was under Schroetter that Dr. George M. Lefferts studied, among others from New York, and it is through Mrs. Lefferts that the New York Academy of Medicine is honored by the gift of this beautiful portrait of Turck, for a time the property of her distinguished husband, - - - It is a source of great regret to Mrs. Lefferts that she cannot be here tonight. To me is given the great honor, on her behalf, of presenting this to you, sir, as the pro tempore head of the Academy.

DR. DUEL: Dr. Harris, there are few, if any, present who do not remember George M. Lefferts as a remarkable man. His eminence as a laryngologist was international; his genius as a teacher was unique; his power as a practitioner was tremendous; his friends and admirers were innumerable; his opinions in the councils of this Academy were constructive, far-seeing, and highly valued. He was an ardent reader in this library, and a warm supporter of the scientific sessions.

This portrait of Professor Turck was one of his valued possessions. It was that of a personal friend and a teacher of his—a man of world-wide renown, whose precepts Dr. Lefferts has handed on to succeeding generations. How appropriate and how touching that this valued possession of one of our most beloved members should be given over to our safe-keeping by Mrs. Lefferts. It will have a double value to us from these associations.

Permit me, Dr. Harris, on behalf of the Academy, to accept this gift with deep appreciation and our warmest thanks to the donor.

AMERICAN BRONCHOSCOPIC SOCIETY.

(Continued from January number.)

Retro Oesophageal Abscess from Self Traumatism, Dr. Gordon Berry, Worcester, Mass.

DISCUSSION.

DR. D. CROSBY GREENE said: I recall a case of foreign body, a small fish bone, which was seen by the doctor who endeavored to locate it by means of the laryngoscope. He passed a probe down but did not get the foreign body. He turned the case over for laryngoscopy. This was done on the same day. It was a very fine fish bone and it was not found. I found at the level of the cricoid a lateral linear tear which was the only lesion discovered. The patient was kept under observation. He ran a slightly septic course but not severely so for a week and then developed a slight swelling of the retro pharyngeal region, but nothing further. The outside of the neck had a slight swelling at the level of the lesion. An incision was made externally and carried down back of the esophagus. We found pus and broken down material which might have been the original bone. This patient made a satisfactory recovery.

DR. L. W. DEAN said: I think the most satisfactory drainage is from the outside. I congratulate Dr. Berry on his diagnosis, because in the department of medicine they had a case which had a history of tonsillitis a few weeks before and following this the patient had persistent sepsis. He was referred to our service for examination of the throat. I was away from the city. The throat examination was negative. Autopsy showed retro-esophageal abscess which had been overlooked by my colleague, who was misled because they had asked for throat examination. One should not always be limited by the special examination asked for by the internist.

If I had a case of retro-esophageal abscess, I would open it externally. The procedure would have to be carefully considered, but I should do this: Make an incision below the level of the cricoid cartilage anterior to the sternomastoid muscle. I would pass my finger through the skin and external muscles mesially till I came in contact with the communication with the vascular and visceral fascia. I would pass through that, using the hemostat and then get into the space between the visceral fascia and the vertebral fascia. These two fascia run parallel from the base of the skull to the thorax. Once I had my finger in this plane I could explore into the base of the skull or into the thorax. If I found pus I could insert a drainage tube and drain the abscess. That would be my method of drainage in such a case.

DR. W. B. CHAMBERLIN said: When we consider the serious results which may follow apparanetly slight trauma to the esophagus (Dr. Greene reported a case of laceration following the swallowing of a pin). It is remarkable that so few fatalities occur. There are very few compared to a number of cases in my own experience. In one case seen personally, a man swallowed a piece of oyster shell and had pain afterwards. I found damage of the left lateral wall where the shell had lacerated, but I could not find the shell. The pain persisted for a time but ultimately he made a complete recovery. In another case an old lady swallowed a piece of bone. There was rather a marked swelling at the left pyriform sinus and in the center of this a small opening with secretion. I probed this but found nothing. I had her report to me for several days. Finally she showed me a half inch piece of bone which she had coughed up. She made a complete recovery. In another case there was stricture which I dilated most carefully. This patient

developed a temperature of 106° with empyema of the right side. Rib resection was done with ultimate recovery. In another case there was a stricture following the ingestion of caustic alkali with suicidal intent. Dilatation was done without trauma. Later the patient developed a temperature of 105°. This gradually subsided and she made a complete recovery. When one thinks of the many cases where foreign bodies are swallowed and crude attempts are made by the family, as well as the physician to dislodge them, and that few of them have a fatal result, we are surprised that all of them do not end fatally.

DR. GEORGE RICHARDS said: In regard to the mortality of the external operation on the esophagus, I can recall one case, where a tooth brush was extracted from the esophagus, which ended fatally. It is said that fatalities arise from the difficulty of after treatment in these cases.

DR. WEIL said: I saw a case a week ago where a patient swallowed a piece of meat and tried to force it down. This was impossible and swallowing was obstructed. I took her to be fluoroscoped and hoped to find the piece of meat. There was a beautiful demonstration by the bismuth, which had all accumulated in the upper part of the esophagus. Suddenly it went down and the patient got instant relief. The bismuth meal had evidently dislodged the particle of meat. It might be worth while to try this with a loose piece of meat, as evidently the weight of the bismuth has some influence in dislodging the particle.

DR. J. S. FRASER (by invitation) said: In regard to the external operation on the esophagus. I don't do the external operation. That is done by the general surgeon. I have seen four cases where a tooth plate was swallowed; two of them I extracted and two were operated upon by the general surgeon. They were easily removed by external operation and the patients made an uninterrupted recovery. In another case where there was a fish bone in the lateral wall of the esophagus, the patient developed, two days later, swelling of the right side of the neck, redness and fever. I thought it was a suitable case for tube work. The general surgeon cut down and found a small abscess between the esophagus and the spinal column. Foul pus was evacuated and a satisfactory recovery followed. We have found the external operation perfectly satisfactory.

DR. L. W. DEAN said: We are not talking about opening the esophagus, but about abscess back of the esophagus. An external operation is indicated in cases of tuberculosis retro-pharyngeal abscess. The drainage tubes are put well down, one tube for Dakin's solution and one for exit, and we have had no difficulty in these cases. If the lymphatics and posterior mediastinal wall have been walled off by nature there is very little difficulty; if not, the patient will die anyway. Nature does wall off the lymphatics. When you open the esophagus externally, no matter what the opening is, after the operation the patient will do well for about 60 hours, then there may be temperature, and if this occurs you may be very sure that you have a posterior media-stinitis from infection by the drainage of the esophagus. If there is need for hurry in these cases it is better to cut out the tooth plate or foreign body, otherwise the patient will die; but if there is time to wait or to put in drainage, the lymphatics will be closed off and you do away with danger from this source. That is you make a 2 stage operation and it is safer.

DR. GORDON BERRY (closing) said: I wish to thank Dr. Dean for bringing out that fact. Dr. Dean mentioned that I was to be congratulated on making this diagnosis. I cannot take credit for that. I was not sure whether it was the tracheal wall or the tissues behind it. Dr. Dean spoke about the fascia. I can visualize this for you by a diagram of the trachea, showing the spinal cord and carotid sheath. (This is subject to Dr. Mosher's correction.) There is fascia between the two and around the trachea and the esophagus. The abscess was around the esophagus in this case. We were between the cricoid and the osephagus and had to go between the esophagus and the deep fascia. The question is can we enter this without causing excessive infiltration and edema. You invite this in the parallel condition of retro-pharyngeal

abscess, which is in the same place, but higher up. Can we drain this abscess lower down? We were not successful but we might be. In regard to fatalities, we are fortunate that some of them do not come to us.

Dr. Patterson Paper.

DISCUSSION.

DR. R. LYNCH said: In regard to pyelitis in bronchoscopy cases, this occurs also in other conditions. We see it rather frequently in New Orleans. There is a sudden rise of temperature and when the urine is examined it shows the presence of pus. I have not met it in bronchoscopy cases. I cannot understand why a sudden rise of temperature should immediately follow bronchoscopy with negative physical findings. Pyelitis is common in New Orleans as a complication of nose or ear lesions.

In regard to syrup of the iodid of iron—we use a mixture of iodid with ammoniated syrup of ipecac. That thins the secretions and helps to empty the bronchi of thick mucus. This is used as a routine.

Six weeks ago there was a case in which a little child had insufflated a piece of charcoal. The roentgenologist was called. When the tonsils were examined they were found covered with membrane containing Klebs-Loeffler bacilli. The child was given antitoxin in sufficient doses to neutralize the diphtheria infection, but there was still a persistent wheeze and evidence of bronchitis. The charcoal was removed from the right bronchus.

Scientific session closed.

At the close of the scientific session the new president, Dr. R. C. Lynch, was installed.

DR. LYNCH said: This specialty has established the etiology of many conditions and is useful to the internist and to the surgeon in clearing up many cases of obscure diagnosis. There is great reason for the continuation of this Society, and I hope with the support of the members that we shall do as well in the future as we have done this year.

DR. F. O. LEWIS, vice president, said: When Mr. Marshall was elected vice president of the United States, he said that he was simply an appendage. I shall consider myself in the same light; but I wish to assure the members that I shall do all that I can to further the interests of the Society.

DR. W. B. CHAMBERLIN, secretary, said: It is a pleasure, as well as something of a burden, to serve you again. Whatever success we have had has been due to the response and co-operation of the members. We can only achieve success by every man doing his part. We have a very good record of attendance this year. Every man has been present with the exception of 12, which is, I think, one good reason for the continuance of this Society. Next year, I hope we shall do even better. The program has been good and there has been ample discussion, which is an important point. There has been an amount of sympathy and co-operation that does not exist in larger societies, and I hope we shall continue as a small society; but with very good men as members. Arrangements have been made with Dr. Goldstein to publish our transactions with full discussion, instead of the former plan with the New York Medical Journal, which was expensive and unsatisfactory. Reprints may be obtained with little expense to the Society.

The meeting was then declared adjourned.